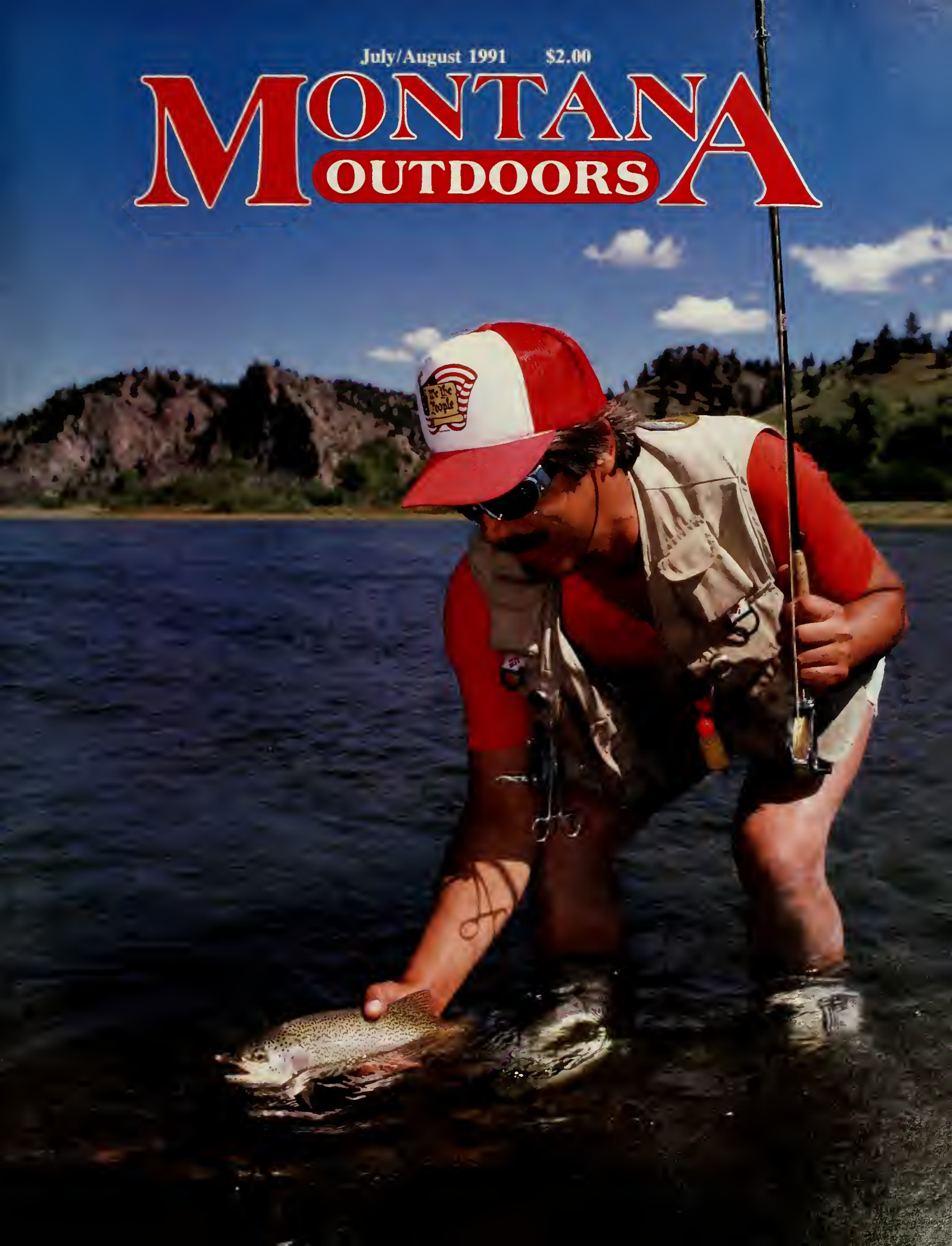
July/August 1991 $2.00

MONTANA OUTDOORS



Our Point of View

DIANE ENSIGN

OUR STATE PARKS represent the unparalleled richness of Montana's natural and cultural resources. These parks give Montanans and our guests a sense of history, provide places of learning and inspiration, and offer opportunities for recreation in the most beautiful surroundings available anywhere. Our state parks enhance our quality of life and represent the things we treasure in this great state. They also contribute over $45 million to Montana's economy annually.

Unfortunately, this wealth has not been used to our advantage and many sites have been inadequately cared for due to lack of funds. Our park resources will continue to deteriorate unless this trend is reversed.

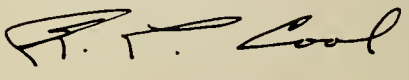
Some initial steps have been taken which must become the foundation to rebuild and preserve these threatened public resources. With the approval of Governor Stan Stephens, the Department of Fish, Wildlife & Parks appointed the State Parks Futures Committee in August 1989. This committee defined the state parks system's problems and offered funding solutions to the Governor, the 1991 Montana Legislature, and our Fish, Wildlife & Parks Commission in a comprehensive November 1990 report.

The Parks Futures Committee helped raise the awareness of the state parks' needs and provided a vision of what the system could be if the proper investments were made in basic improvements, protection, and visitor services.

The Montana Legislature added nearly $1 million per year to the Parks Division for the next two years for park improvements, half of which will go to historic and cultural preservation. The Legislature also added a much needed Park Ranger Program to enhance visitor safety and decrease vandalism. The Montana Conservation Corps was also revitalized in partnership with a private initiative to seek federal funds which could help upgrade some sites.

But, as welcome as these actions have been, the amount of money received for operating and improving parks is only a first step. We are still far short of what is needed to bring the park system up to a responsible level of stewardship and quality. A backlog of over $60 million of construction and protection needs remain. More operation and maintenance dollars and personnel are required to fulfill our mandates and restore the health of these valuable areas.

Montana parks have the potential to be among the best in the nation. The foundation has been laid for a brighter future. Parks are people places. We thank you for your past support and we request your active involvement in charting the future as we work together to rebuild this vital part of Montana.



K.L. Cool
Director
Montana Department of Fish, Wildlife & Parks

CONRAD ROWE

Turn to page 32 for an article on Missouri River trout management.

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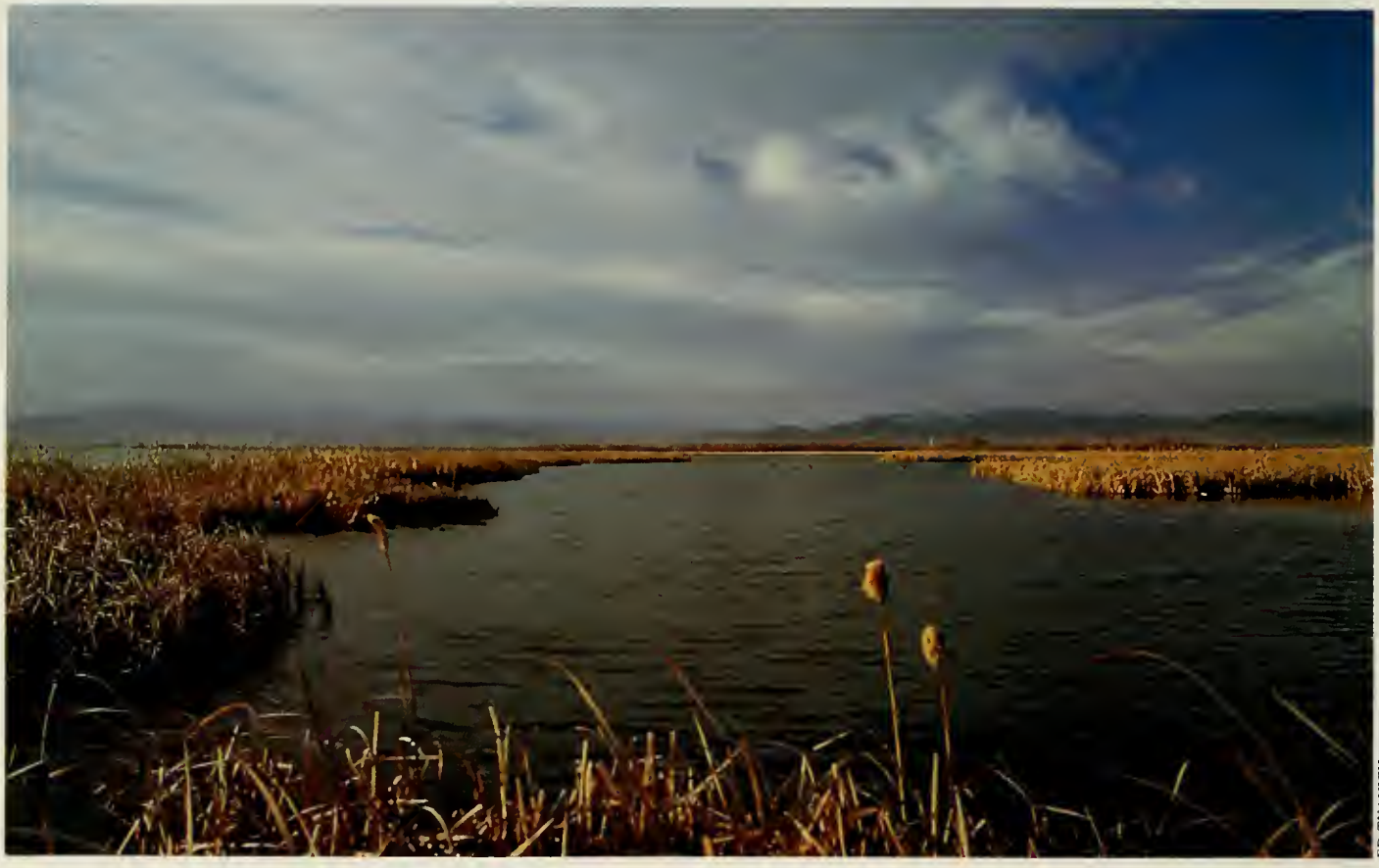
Back Cover—Giant Springs is one of the largest freshwater springs in the nation. The state park at that site has many temptations for visitors—picnicking on the banks of the Missouri, touring the Visitor Center, or enjoying the fish hatchery. The site also offers some breathtaking Montana sunsets, as **Kristi DuBois'** photograph attests.



ED TYANICH

Lake Helena Wildlife Management Area

DUCK CONDOS ON THE LAKE

by TOM PALMER

ON THE FIRST DAY of spring Lake Helena was capped with glacial-white ice gradually rotting away as the days grew longer. Where the ice had receded from shore, tranquil bays of open water held small rafts of Canada geese and tundra and trumpeter swans. Some trumpeter swans had bands of orange dye around their long necks, evidence that they were among the 354 birds that have historically wintered on Idaho's Henry's Fork River, but were trapped and transplanted to more hospitable habitats farther south.

These swans would soon move northward, as would the hundreds of mallards and pintails gathered at the mouths of Prickly Pear, Tenmile, and Silver creeks, three of Helena's most historic streams.

Lake Helena, just 10 miles northeast of Helena, is an unusual place with its own odd history. Millions of years ago

TOM WARREN

At 157 acres, Lake Helena Wildlife Management Area is a small but vital breeding and resting area for waterfowl in the Helena Valley.

there was a much larger lake here. That ancient lake was created by glaciers that pushed, crunched, and bent the Missouri River so severely that they changed the river's course, and for centuries the obstructed waters filled the Prickly Pear Valley.

Modern Lake Helena's creation is not nearly as heroic, but its origin is similarly related to an obstructed Missouri River. The 2,100-acre lake, which reaches a maximum depth of only 10 feet, is actually the shallow backwater produced by a dam built on the Missouri River in 1906 to generate hydroelectric power for hardrock mines as far away as Butte. In 1908, the dam failed and its collapse precipitated the financial ruin of Samuel T. Hauser, one of Montana's leading and best-loved industrialists. The dam's failure, and the political and financial intrigue it wrought as reconstruction plans were laid, eventually led to creation of the Montana Power Company, the present owner of Hauser Dam.

Crop irrigation in the valley predates the construction of Hauser Dam, but water birds know nothing of history. The streams, ditches, and canals splaying from the lake's western shores have long provided winter shelter for hundreds of mallards. In a few more weeks those same ditches will deliver water to the surrounding hayfields and, when the growing season begins, about 200 Canada geese will care for their broods on the periphery of the lake. In time, there is hope that mallards will become as successful in breeding and raising their young on the lake.

"We need such places, and more of them. As a nation, we have lost 53% of our wetlands. A U.S. Fish and Wildlife Service congressional report shows that Montana has lost 27% of its wetlands since 1780."

We need such places, and more of them. As a nation, we have lost 53% of our wetlands. A U.S. Fish and Wildlife Service congressional report shows that Montana has lost 27% of its wetlands since 1780. The contiguous United States have lost about 1,440 wetland acres a day for more than 200 years.

As a result of wetland losses and deterioration of adjacent grasslands, duck numbers have fallen behind the curve. Continental populations of mallards, pintails, blue-winged teal, and other prairie ducks have declined to record lows. In just the past 20 years, the number of ducks in the famed Prairie Pothole region fell from between 26 million and 28 million to about 13 million ducks.

Those are desperate statistics, but last year Lake Helena helped to stem that

DAVE BOOKS

Largely as a result of wetland losses, continental populations of mallards (shown here), pintails, blue-winged teal, and other prairie ducks have declined to record lows in recent years. Areas like Lake Helena WMA are helping to stem that tide.

tremendously destructive tide when two mallard hens hatched their broods from artificial nest structures. A drop in a bucket? No doubt. But it's at least a start.

THE MONTANA DEPARTMENT of Fish, Wildlife & Parks has had an interest in Lake Helena, a local waterfowl hunting hot spot, for nearly 50 years. In 1945, landowners Brian and Hazel O'Connell provided a virtually forgotten public easement for waterfowl hunters around much of the lake's southern and western shores. In recent years FW&P biologists have conducted waterfowl breeding surveys on the lake and, in 1990, FW&P purchased a small gerrymandered chunk of land that follows the contour of the high-water mark along the lake's northwestern shore.

At 157 acres, the Lake Helena Wildlife Management Area (WMA) is smaller than a land-rush homestead, but nonetheless it is full of promise. The land purchase was funded from sale of Montana's waterfowl stamp, a Ducks Unlimited MARSH (Matching Aid to Restore State's Habitat) grant, and FW&P's wildlife habitat acquisition program. The property was offered to FW&P by rancher Wes Johnson, who expressed an interest in maintaining year-round public access to the lake. That wish will now certainly come to fruition as FW&P pursues plans to improve public access to the WMA and looks into the possibility of acquiring additional easements for limited vehicle and foot-traffic access.

The goal of the Lake Helena WMA is to "improve waterfowl production potential...through proper land stewardship, and to provide and maintain public hunting opportunities and recreational access to the lake."

As it stands today, the valley annually produces several hundred Canada geese, but breeding and predator-safe nesting space for ducks is sorely inadequate. When ducks set wing for their northern breeding grounds, they like to get right down to business, so they need places where upland grasses remain abundant enough over the winter to hide a nest in the early spring. Waterfowl biologists call it "residual cover," and for the most part it is lacking at Lake Helena primarily due to cattle that have been allowed to graze the grasses.

The plan at the Lake Helena WMA is to control and set limits on the times and places that cattle will be permitted to graze, and to actually use the cattle as a conservation tool to create better nesting habitats around the lake and to improve the state of the grasses and other vegetation on the land.

Throughout the northern tier of the United States and into Canada, many of the monumental wetland rehabilitation and enhancement projects have a common component: the construction of predator-free nesting islands. Islands eliminate the threat of nest-marauding predators, like foxes and skunks, and dramatically boost nest success rates. But, due to the lack of gravels in the soft alluvial soils surrounding Lake Helena, the cost to haul materials to the lake may prohibit any plan that calls for island building.

"There's no fill for islands nearby," says wildlife biologist Gayle Joslin, "so we have to do it in reverse. We have to build little ponds if we're going to increase the number of breeding pairs of ducks."

One immediate way to assist breeding

GAYLE JOSLIN

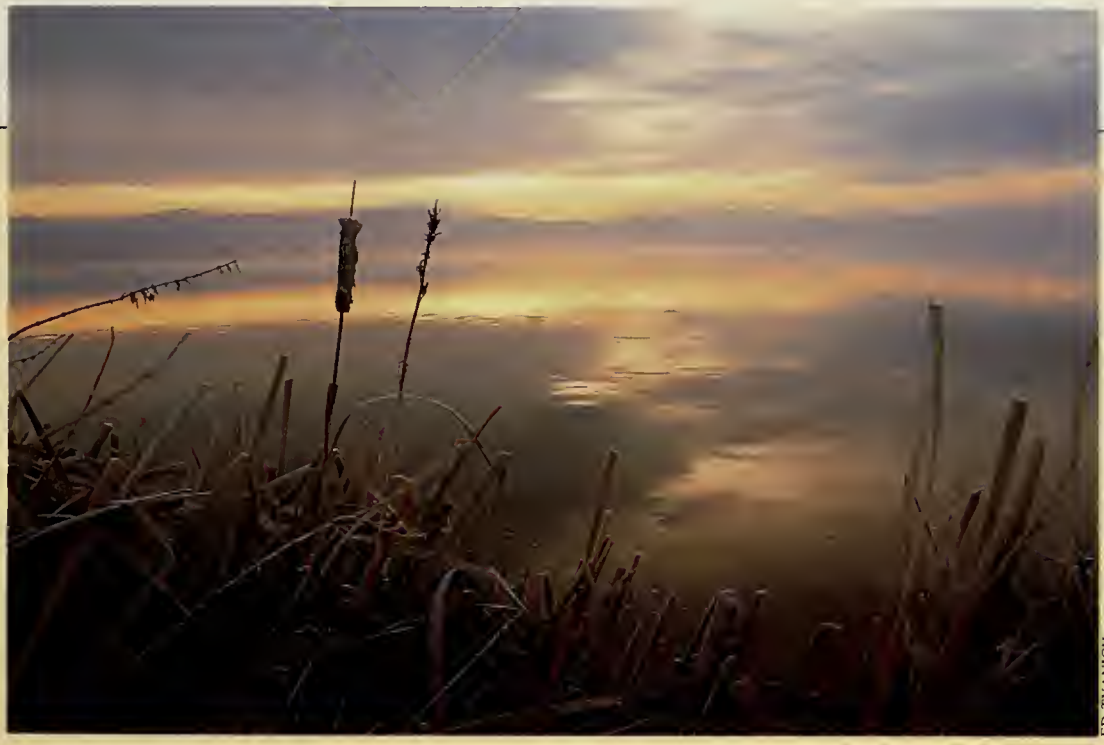
Artificial nest structures have been installed at Lake Helena WMA to enhance nesting opportunities for mallards. These "duck condos" eliminate the threat of nest-marauding predators like foxes and skunks.

ducks is to supply the lake with artificial nest structures. Joslin says she'd rather let a natural system work as it will, but she insists that the prospect of such "hands on" management at Lake Helena is a necessity. Lake Helena is surrounded by privately owned farm and ranch land, most of which is grazed by livestock. And, because it's so close to Helena, there's little doubt that the agricultural land could one day be subdivided for lake front residential developments. "This is not a natural system anymore," Joslin says. "We have to do whatever we can to help the ducks, and every little bit helps."

Last year Joslin helped to install what she calls, "duck condos" on the Lake Helena marsh owned by the Montana Power Company. The artificial nesting structures—one was placed on a steel pole and the other on a steel culvert tipped on its end, and thus out of the reach of most predators—were specifically designed to enhance nesting opportunities for mallards. And they worked. The two hens that nested in the condos last year, and the ducks they fledged, will likely return to nest again.

"I guess you could say we had a 100% nesting success rate last year," Joslin joked, walking across the uplands to a small pond near the center of the WMA. The pond is hidden by surrounding acres of marsh and cattails, so it was a surprise to see platoons of ducks spring up from the marsh and wing off to east. "If we're going to make this country hold more ducks, we'll need more of these ponds to do it," she says.

Beyond the pond, Joslin spotted two sandhill cranes poking about the cattails. The cranes lifted their heads to watch the ducks and unfurled their own enormous wings to glide deeper into the distance. The muffled squawks of ducks, geese, and swans were also carried on the wind. Then the cranes set down, gracefully and silently, figuring they had found a good place to spend some time.■

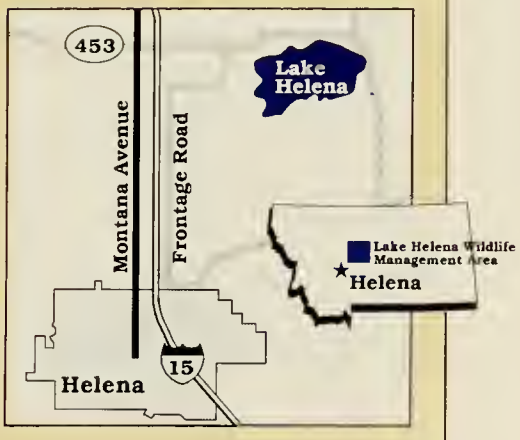


ED TYANICH

The primary goal of Lake Helena WMA is to improve waterfowl production through proper land stewardship.

Lake Helena Wildlife Management Area

Location: Lewis and Clark County, about 10 miles northeast of Helena.
Size: 157 acres.
Access: Road access for boat launching and general access to the 2,100-acre lake is available off Route 453.
Management goal: To improve the waterfowl production potential of the land, and to provide and maintain public hunting and recreational access to the lake.
Hunting opportunities: Seasonal opportunities to hunt ducks and geese.
Wildlife viewing: Year-round bird-watching and wildlife photography opportunities. Spring and fall migration periods offer opportunities to view an array of species, from swans to eagles.



Scenes From a Hatchery Year

by José R. Serrano-Piche and Thurston Dotson

Scene One

As the sun begins to chase the night, you are poised with fly rod in hand, ready to cast into the glass-smooth waters of a small high mountain lake. Pausing, your mind wanders to the previous day when you hiked to this lake late in the evening.

MT DEPT OF FISH, WILDLIFE & PARKS

Montana's hatchery system produces fish primarily for waters unable to sustain natural reproduction.

The need to set up camp in the few remaining minutes of light was the only force which prevented you from unpacking your gear to answer the rises of fish.

As your mind returns to the present, you pull your rod back, ready to make your first cast. Suddenly the drone of a distant plane breaks the pristine silence. A flash of early morning sun locates the craft to the west and it seems to be headed for your lake. As the plane descends over the lake, fish and water stream from underneath the aircraft. The pilot pulls up and wings behind some nearby peaks. Quiet returns to the scene, and you realize how fish happen to get to such isolated and protected spots.

Scene Two

You have had a fun-filled day of fishing and boating on Holter Lake. As you approach the boat ramp, you see the driver of a large fish distribution truck preparing to stock fingerling trout in the lake. You ask the driver where he is from, what strain of rainbow he is planting, and the size of the fish.

The Department of Fish, Wildlife & Parks employee answers all your questions as he tends to pumps and hoses, keeps an eye on the water level in the tanks, and occasionally takes the temperature of the water inside the tanks. When the water is the same temperature as lake water, he starts opening gates and valves. Within a short time, thousands of fish find a new home in Holter Lake.

Scene Three

As you travel the road along the west shore of Tongue River Reservoir, you mildly object to the dust kicked up by the vehicle ahead of you. You see the pickup has a tank in the bed and a grizzly bear seal on the door so you know the truck is from FW&P. Your interest is sparked and you decide to brave the dust to see firsthand what is happening.

The driver turns into a bay with a boat access and backs up to the water's edge. Pulling up beside him, you ask if you can watch. You learn he is from the Miles City Fish Hatchery and he is preparing to stock several thousand walleye into Tongue River Reservoir. As you visit, he pumps in fresh water and acclimates the fish in the tank to lake water. He then releases the fish into their new home.

With variations, the scenes described above are played out several hundred times each summer as hatchery workers replenish Montana lakes and reservoirs with fish from the department's hatcheries.

FISH STOCKING IN MONTANA was the primary method of fish management until the late 1940s and early '50s. Before that, the department operated under the well-intended but erroneous concept that if you take a fish out of a lake or stream, you must replace it. This concept ignored the reproductive powers of Mother Nature. As fisheries biologists came to realize that with good habitat a healthy wild population was fully capable of taking care of itself, the role of fish hatcheries started changing.

The hatchery system produces fish for use in state management programs requiring supplemental stocking. One important function is to produce fish for management of waters unable to sustain natural reproduction and unable to support strong resident populations of fish. Examples would include stocking rainbow trout in waters such as Canyon Ferry and Clark Canyon reservoirs. Another important function is to maintain genetically pure brood stock.

To meet management needs, the department stocks approximately 19 species and/or strains of fish each year. They range from domestic and wild strains of trout and salmon to crappie and walleye.

The capability of each hatchery varies with its geographic location and type of installation. Hatcheries considered production hatcheries—they receive eggs from other sources and rear fish to stocking size—include Giant Springs Trout Hatchery at Great Falls, Big Springs Trout Hatchery at Lewistown, Bluewater Springs Trout Hatchery near Bridger, Murray Springs Hatchery near Eureka, and Flathead Lake Salmon Hatchery near Somers. Brood stock hatcheries are those that maintain adult fish to produce eggs; they include Washoe Park Trout Hatchery at Anaconda, Jocko River Trout Hatchery at Arlee, and the Yellowstone River Trout Hatchery at Big Timber. The species raised at state hatcheries are as varied as the state itself: kokanee salmon; brown, brook, lake, and several strains of rainbow trout; westslope, Yellowstone, and greenback cutthroat trout; walleye, northern pike, crappie, largemouth and smallmouth bass, catfish, and tiger muskellunge.

Big Springs is the largest cold-water hatchery operated by FW&P; it raises approximately 3 million fish per year. Bluewater and Giant Springs each rear approximately 2 million fish per year. Murray Springs is a special situation. Although operated by the state of Montana, the U.S. Army Corps of Engineers owns the installations and provides operating and maintenance funds as partial mitigation for fishery losses sustained when the Corps constructed Libby Dam and impounded Lake Koocanusa.

Flathead Lake Salmon Hatchery is a special facility in which the only species raised is kokanee salmon. After the eggs are collected from the wild, they are taken to this hatchery to be incubated until two small, period-sized black dots are visible on the head—this is called the "eyed stage." Then some eggs are shipped to other fish hatcheries to finish their incubation and rearing. Other eggs are held back, hatched, and later moved to outside floating pens in Flathead Lake until the young fish are planted.

In Montana's system, brood stock hatcheries provide the majority of the eggs needed for the cold-water fish-stocking program. Through careful gene screening and planned genetic monitoring, these facilities have maintained a healthy population from which to obtain eggs without problems of inbreeding. The Arlee rainbow trout brood stock is maintained at Arlee in the Jocko River Trout Hatchery. To maintain genetic integrity, the two subspecies of cutthroat, the westslope and the Yellowstone, each require a hatchery. The Washoe Park Trout Hatchery at Anaconda houses the westslope brood stock and the Yellowstone River Trout Hatchery at Big Timber the Yellowstone cutthroat brood stock.

MT. DEPT. OF FISH, WILDLIFE & PARKS

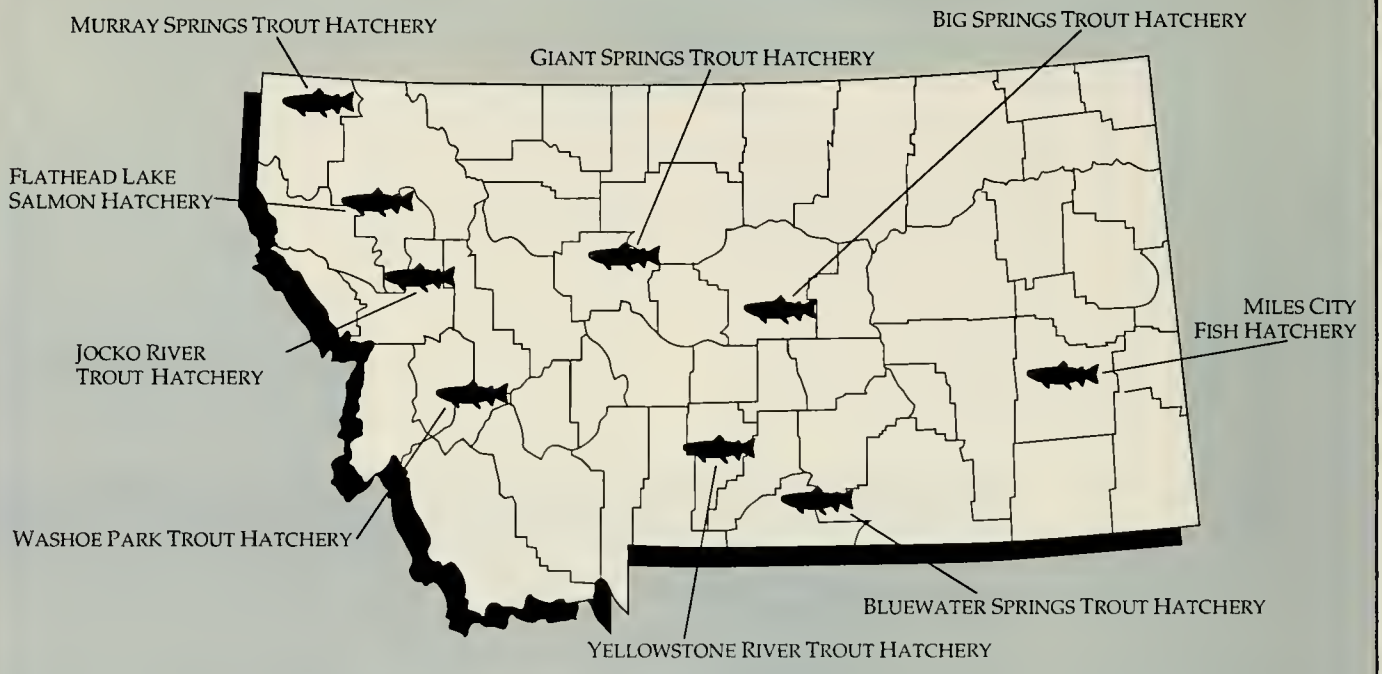
Big Springs Trout Hatchery in Lewistown raises 3 million fish per year.

At times, special needs for management of fisheries resources require the acquisition of wild-based fish, as in the case of DeSmet rainbow trout. In these circumstances, wild spawning populations are trapped, spawned, and their fertilized eggs brought to a fish hatchery.

In the eastern part of the state, the Miles City Fish Hatchery plays a very important part in the warm-water fishery program. This facility is the only hatchery in the state capable of raising species such as northern pike, walleye, small and largemouth bass, and other cool and warm-water species of fish. Occasionally, this hatchery also raises cold-water fish such as rainbow and lake trout and chinook salmon.

Because Montana is a headwater state for both sides of the Continental Divide, actions which affect fish quality here

MONTANA'S FISH HATCHERIES


MURRAY SPRINGS TROUT HATCHERY
GIANT SPRINGS TROUT HATCHERY
BIG SPRINGS TROUT HATCHERY
FLATHEAD LAKE SALMON HATCHERY
MILES CITY FISH HATCHERY
JOCKO RIVER TROUT HATCHERY
WASHOE PARK TROUT HATCHERY
BLUEWATER SPRINGS TROUT HATCHERY
YELLOWSTONE RIVER TROUT HATCHERY

could have effects far down the Columbia as well as the Missouri and Yellowstone rivers. To protect the unique population of fish in this state and to assure that fish we stock do not introduce new disease organisms downstream, Montana has a strong fish health program. The department maintains its Fish Health Laboratory at Giant Springs Trout Hatchery. A fish health biologist is responsible for diagnosing diseases and prescribing treatments.

TO HELP YOU MORE FULLY UNDERSTAND the operation of a fish hatchery, we will follow the Giant Springs Trout Hatchery through a series of activities.

At 11:30 on a cold February night, as a light snow falls, three large insulated cases containing 580,000 eggs which hatchery workers have been waiting for all day finally arrive on a flight from Colorado. The live kokanee salmon eggs have been in transit since early that morning, but thanks to the insulated cases in which they were shipped, and the slowly melting ice placed with them, the eggs have stayed moist and cool throughout the day, arriving in excellent condition with little mortality.

The eggs were originally taken from the wild in Colorado during the second week of December, and incubated at a hatchery in that state until reaching a developmental stage hardy enough to withstand shipment.

Through a mutually beneficial agreement with Colorado and other states, the cost to the state of Montana for these eggs is only the cost of shipment and replacement of the cases in which they were shipped. A few weeks later, this agreement allowed Montana to receive another 444,000 kokanee eggs from Colorado; in return, the state of Montana shipped golden trout eggs to Colorado.

"To meet management needs, the department stocks approximately 19 species and/or strains of fish each year. They range from domestic and wild strains of trout and salmon to crappie and walleye."

Fish from Giant Springs are stocked wherever department studies show planting is necessary. Fish from this hatchery are stocked in an area stretching from McGregor Lake west of Kalispell to small ponds near the North Dakota border on the Hi-Line. The 9,000-plus gallons per minute (gpm) of water used by the hatchery when running at full capacity come from world-famous Giant Springs. Approximately 850 gpm are

pumped to inside troughs where small fish are kept; the rest of the water is gravity-fed to outside raceways which can hold up to 1 million, four-inch fish. This volume of spring water available at a constant temperature of 54°F makes conditions almost perfect for raising cold-water fish.

Besides raising fish, other winter duties for the full-time three-person crew at Giant Springs are snow removal and maintenance of vehicles, buildings, grounds, and equipment. In addition, each person must take a turn at security, remaining on the hatchery grounds 24 hours per day. A computer monitors water levels and other vital information in the hatchery and alerts the person on duty in case of pump failure or other critical situations. If a pump fails when troughs in the hatchery are full of fish, up to 1 million fish could be lost.

IN A TYPICAL YEAR, kokanee salmon and three strains of rainbow trout are raised at Giant Springs. Of the 2 million fish from Giant Springs planted each year, about 250,000 are kokanee and the remaining 1,750,000 are Arlee, DeSmet, and Eagle Lake rainbow. The reason for raising various strains of rainbow is that no single strain does well in all lakes and streams. What works well in one reservoir may not survive in another.

Fast growth and catchability characterize the Arlee strain. It is hardy and easy to raise, although somewhat short-lived. The Arlee rainbow, originally developed in Montana, owes its name to the fact that the state has placed its brood stock at the Jocko River Trout Hatchery in Arlee. This fish has been selected for over 30 years for the characteristics already mentioned as well as for its spawning pattern. Unlike a wild rainbow trout, which spawns in late winter to early spring, the Arlee rainbow spawns in the fall and early winter. This late spawning results in larger fish for stocking the following spring, increasing their chances for survival in the wild. Another benefit of having larger fish by early summer is that hatchery workers are able to plant catchable-sized fish at places where this practice is still necessary.

The DeSmet rainbow trout, originally from Lake DeSmet, Wyoming, is another strain reared at the Great Falls Trout Hatchery. It is characterized by long life, slower growth, and average catchability. It reproduces in the wild because of its natural spawning instincts. DeSmet eggs are taken from wild spawning fish at Willow Creek Reservoir. This population was originally established by stocking of fish which originated from the Wyoming stock.

The Eagle Lake rainbow trout, originally from Eagle Lake, California, also shows characteristics of a wild fish. It is a spring spawner with good growth rates; it eats a variety of food organisms including forage fish, invertebrates, and plankton, depending on circumstances and conditions. Eagle Lake rainbow used in Montana hatcheries are received from the Ennis and Creston National Fish hatcheries.

A strain of rainbow used to stock some waters is a cross between the Arlee and Eagle Lake strains. To accomplish this cross, spawn from early-maturing males at Creston National Fish Hatchery is used to fertilize eggs from late-maturing Arlee females. This usually happens in late December or early January. Research biologists are still evaluating the performance of this fish—which might have the best attributes of both.

In late September to early October, Giant Springs Trout Hatchery receives its first shipment of eyed Arlee rainbow trout eggs from the Jocko hatchery. Thereafter, a shipment of eggs is received every two to four weeks until about the middle of January. The number of eggs received reflects an expected mortality of approximately 20%. Thus, to plant 750,000 trout, hatchery workers start with at least 937,500 eggs.

The eggs are placed in incubators with fresh water bathing them. As already mentioned, the temperature of the water at Giant Springs is 54°F. At that temperature, eggs will hatch in

Hatchery workers spray rainbow trout with fluorescent dye for later genetic strain and year-class identification. This inert dye, which becomes embedded in scales, fins, and soft tissues, cannot be seen with the naked eye but can be detected with ultraviolet light.

MT. DEPT. OF FISH, WILDLIFE & PARKS

approximately 10 days; the lower the temperature, the longer the period of incubation.

While the eggs are incubating, hatchery workers diligently check and clean them. Daily, they remove dead eggs, fungus, and protein matter that could suffocate healthy eggs. This time-consuming task, critical to the well-being of the healthy fish eggs, sometimes requires as much as half a day for a large batch of eggs. Workers clean eggs by hand, using a small rubber bulb to which a short piece of clear tubing is attached. By carefully manipulating the bulb, they can siphon foreign matter off the eggs.

The newly hatched fish, called "sac-fry" because of the yolk sac attached to the underside, will then be laid out in long, shallow troughs. They will absorb the yolk sac for nourishment during post-hatching development and they will not need food for two to three weeks. Daily care and cleaning of the young fish is necessary to remove fungus, broken egg shells, and dead or crippled sac-fry.

By the third week, the young fish will have absorbed most of the egg yolk and will be able to swim. Feeding begins at this point. At this stage in their development, they are called "swim-up fry."

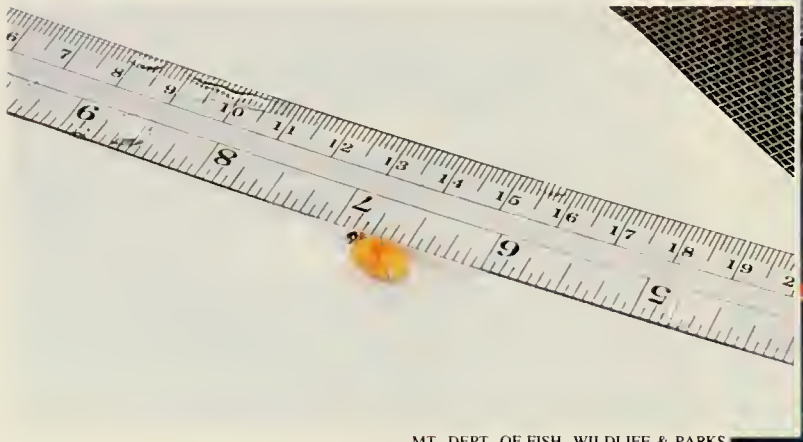
Throughout their life at the hatchery, the fish are moved into progressively larger quarters. When they reach a length of two to three inches, the "fingerlings" are moved to outside raceways. The fish grow almost an inch per month and double their weight about every six weeks. By early April, almost all of Giant Springs' 24 outside raceways and most inside hatchery troughs are at full capacity.

RAIN OR SHINE, all fish must be fed four to six times per day. In order to control pathogenic bacteria and parasites, all inside troughs must be cleaned daily; outside raceways must be cleaned twice a week.

As the ice melts from lakes, rivers, and reservoirs and water temperatures rise, the new planting season is in sight. When a planted fish darts into the depths of its new home, a new hope begins: a promise of warm summer days when youngsters and adults will share those special moments of caring, teaching, and learning—and passing on their fishing heritage. Those special times are what life is made of . . . and for certain waters Montana's hatchery system is an integral part of making those special times a reality. ■

MIKE ADERHOLD

Hatchery manager Stewart Kienow collects kokanee eggs for incubation and rearing at Flathead Lake Salmon Hatchery. The yolk sac (yellow portion) of the newly hatched fry sustains it during the first few weeks of development.



MT. DEPT. OF FISH, WILDLIFE & PARKS

THE TEN COMMANDMENTS OF RIVER ETIQUETTE

by MIKE LIGHTLE

It's seven o'clock in the morning, and the butterflies fluttering around in your stomach feel more like seagulls than butterflies. You've been standing at the boat launch of your favorite blue ribbon river, waiting to launch your boat. There is not a breath of wind in the air, and everywhere you look there are pods of trout rising to small mayflies. You want to start fishing.

Over the last month, you've spent countless hours behind your fly-tying bench, tying flies for this very moment. You've cleaned, prepared, and packed all your fishing gear, meticulously planning for every contingency, all in preparation for the first fishing trip of the year. The butterfly feeling in your stomach is slowly turning into anger as you wait, impatiently, for the fisherman ahead of you to launch his raft. Unfortunately, this fisherman has decided to inflate his raft and rig up his rod right in the middle of the boat launch, blocking your access to the river. "That's all right, it should take less than an hour."

Has this ever happened to you? Or more to the point—have you ever been the scoundrel who blocked access to the river, either at the put-in or take-out? Blocking access is only one of many unwritten, common-sense rules that newcomers to any sport—especially a complicated sport such as fly-fishing—often break. They don't break them on purpose or with malice; it's simply a lack of knowledge.

There has been a substantial increase in the number of people recreating on Montana rivers over the past few years. With the increasing popularity of fishing in general and fly-fishing in particular, Montana's blue ribbon rivers are receiving pressure like never before. It's only natural to expect that a substantial portion of people using the rivers are going to be green and unaware of some of the basic rules of the game. Reports of "drift boat grid lock," bouts of name calling, and even fist fights on the Bighorn are becoming all too common. For years, crowds of anglers have flocked to the famous blue ribbon rivers of Montana, especially during the salmon fly hatches on the Madison, the Big Hole, and the Yellowstone rivers, without too many conflicts and certainly no fist fights.

In an attempt to identify and then solve some of the most common conflicts on Montana rivers, the Pat Barnes Missouri River Chapter of Trout Unlimited, the Missouri River Flyfishers, and the Montana Department of Fish, Wildlife & Parks put their heads together and came up with "The Ten Commandments of River Etiquette." This collaboration has resulted in river etiquette signs at five major access points along the Missouri River below Holter Dam. Many of the conflicts on the river could be avoided entirely by following a few simple rules.

The Ten Commandments

Thou shalt not block the access:

When launching or retrieving your boat, do not block access to the boat ramp. In other words, before backing down the boat ramp, have all of your gear ready so all you need to do is get in your boat and go. Equally important, when leaving the river, move your boat out of the access quickly.

Thou shalt give fellow anglers plenty of elbow room:

Floaters should avoid waters where wading anglers are fishing. A good rule of thumb is to draw an imaginary circle, with a diameter of 50 yards (100 yards is even better) around all fishermen you encounter on the river. Stay outside the perimeter of that circle. This also applies to anglers fishing from a boat—stay at least 50 yards away from all boats you encounter on the river.

Thou shalt not trespass:

Respect landowner rights and privacy. Gain access to the river through established access sites only or, on private lands, with permission.

Thou shalt make no wake:

Motorboat wakes can be hazardous to small craft and wading anglers. Wakes also disrupt surface-feeding fish. Make no wake when floaters or wading anglers are in the area.

Thou shalt not litter:

Help to keep all Montana rivers clean and beautiful—do not litter, and pick up any litter you see.

Thou shalt conserve the resource:

Each river is different, and in many cases you may be helping a river by harvesting certain sizes of fish. But, generally, you can help to conserve the high quality trout fisheries with which we are blessed by *voluntarily* limiting the number of large trout you keep.

Thou shalt know the regulations:

Special limits and/or boating regulations may be in effect. Know the current regulations before fishing on the river.

Thou shalt not wade in spawning areas:

Do not wade in spawning redds. What are redds, and how do you spot them? Redds are areas of polished gravel used by spawning fish to lay their eggs. They are easy to see since the gravel is usually brighter than the surrounding gravel because the trout have swept the area clean of sand—therefore the polished look. Stepping on or wading through the redds crushes and displaces the spawn. This is especially critical on the Bighorn where rainbows and browns both spawn in the side channels.

Thou shalt know how to handle your boat:

Of course it's a "Catch 22"—how can you learn how to handle a new boat unless you take it out on the river? Read about rowing technique, watch a video, take a class, or go out with someone who can teach you the basics before you join the crowd at the height of the salmon fly hatch.

Thou shalt think before acting:

This is probably the most important commandment. Before doing anything, think to yourself, "Is this going to affect someone else's fishing pleasure? Would I like it if someone did this to me?" Be alert, and be attentive and polite to your fellow anglers.

For most fishermen and women, time on the river is special. It's time spent enjoying nature and getting away from the stress of every-day life—and fooling trout into taking our imitation flies. Montana's rivers are not nearly as crowded as those of some neighboring states, and most Montanans are knowledgeable about river etiquette. If we all take a little more time to consider the effect of our actions on other anglers, we could all enjoy our time on the river just a little bit more. Montana is still "The Last Best Place." Let's try to keep it that way.—*Mike Lightle, board member, Pat Barnes Missouri River Chapter, Trout Unlimited*

FISHING ACCESS
This access is provided through the courtesy of the land owner.
Please treat the area with respect.
Thank you.
Mont. Dept. of Fish, Wildlife & Parks

DAVID PAYNE

All fishermen should respect landowner rights and privacy.

MT. DEPT. OF FISH, WILDLIFE & PARKS

FW&P biologists Ray Mule (left) and Scott Denson with their awards for outstanding service.

BIOLOGISTS RECEIVE AWARDS

Two Region Six (Glasgow) biologists for the Department of Fish, Wildlife & Parks recently received awards from the Montana Chapter of The Wildlife Society. Scott Denson and Ray Mule were recognized for outstanding accomplishments in the performance of their duties as wildlife biologists.

Denson, the Malta area biologist for the past four years, received the Biologist of the Year award, which is presented annually. He also received an Honorary Sponsor's award from Ducks Unlimited for "Unselfish dedication and significant achievement in waterfowl conservation." Ducks Unlimited is an international organization dedicated to wetlands conservation and enhancement for waterfowl.

Denson's accomplishments include initiation and completion of several waterfowl projects associated with the Prairie Pothole Joint Venture on private and federal lands in Phillips County. He also worked with area landowners and irrigation districts to promote waterfowl and upland bird habitat in Valley and Phillips counties.

Mule has been the Culbertson area biologist for the past six years. He received Pheasants Forever's Wildlife Professional of the Year award for "outstanding cooperation and contribution to the restoration of upland game bird habitat." Pheasants Forever is a nationwide organization dedicated to restoration and development of habitat for pheasants and the education of the public concerning needs and benefits of improving upland bird habitat.

Mule has worked with many landowners in Sheridan, Daniels, Roosevelt, Richland, and McCone counties to initiate

improvements in upland bird habitat through FW&P's Upland Game Bird Habitat Enhancement Program. This program is funded by revenue from sale of game bird licenses.

Their awards were presented at The Wildlife Society's annual meeting in Bozeman.—*Jim Liebelt, Region Six (Glasgow) information officer*

MT DEPT OF FISH, WILDLIFE & PARKS

Pictured are Chuck Olson (center) and his wife Jeanne with FW&P officials Larry Peterman (far left), Al Elser (holding check), and Jerry Wells (right).

Olson Estate Bequeaths Money for Fly-Fishing Access

The Montana Department of Fish, Wildlife & Parks accepted a $50,000 gift recently from the estate of Matt C. Olson of Red Lodge who wanted to create a public access site for fly-fishermen.

Mr. Olson was an avid fly-fisherman who was employed as supervisor for overseas oil rigs when he died in an accident at age 35. He left the money to the Montana Fish, Wildlife & Parks Commission "for the acquisition of a fishing access area for fly-fishing only." Because the commission has no authority to create access sites for specific users, his gift was transferred to the Montana Trout Foundation. The foundation has agreed to use the money to purchase a fly-fishing access site that meets with the estate's request.

"Matt was an extraordinary man, with a deep love and appreciation for Montana's unequaled fly-fishing opportunities. He wanted to share that love and appreciation with others, and his gift will allow that to happen," said Andy Olson, a brother of Matt's and executor of the estate. Another brother, Chuck, and his wife, Jeanne, were in attendance when the gift was presented to FW&P officials.

Wentland Receives DU Award

Harold Wentland, the department's wildlife manager in Region Six (Glasgow), received the first annual Montana Ducks Unlimited Wetland Professional of the Year award.

The award recognized the wildlife professional "who has had the most impact on wetlands conservation in Montana during the year," according to DU Regional Director Steve Bayless. "Harold demonstrated exceptional leadership and was responsible for implementing and directing a number of significant waterfowl projects in cooperation with Ducks Unlimited in the Glasgow region this past year," Bayless added.

MT DEPT OF FISH, WILDLIFE & PARKS

FW&P wildlife manager Harold Wentland with his Montana Ducks Unlimited Wetland Professional of the Year award.

Missouri River

Continued from page 37

forged to protect instream flows in key spawning tributaries.

River corridor protection is also a challenging and important issue. New cabins and homes sprout up on the banks of the Missouri each year. The river bank is often stripped of vital riparian (streamside) vegetation and transformed to manicured lawns. Bank stabilization devices such as riprap or retaining walls are often required to prevent erosion stimulated by loss of deep-rooted woody vegetation like willows. Alterations of this type have cumulative negative effects on trout populations and their food supply. But perhaps more important, they lower the quality of the river experience and diminish the river's intrinsic value.

Substantial progress can be made on these problems, but it will require public involvement, commitment, education, and cooperation. Crowding may be a problem we're forced to accept but we can do some things to reclaim a measure of the lost quality. Local angling clubs are actively promoting concepts of river etiquette—a good first step.

The 1980s could be called a decade of discovery. The nation's anglers discovered the Missouri trout fishery, and resource managers discovered some new and innovative ways of coping with problems created by drought and increased angling use. Many more problems remain to be solved, but by working together we may be able to pass a newer and improved Missouri River on to the fishers of the next millennium.■

CONTRIBUTORS

• Until the late 1940s or early '50s, fish stocking was the primary method of fish management in Montana. But as **Jose' R. Serrano-Piche** and **Thurston Dotson** write, "As fisheries biologists came to realize that with good habitat a healthy wild population was fully capable of taking care of itself, the role of fish hatcheries started changing." Simply put, the hatchery system produces fish for use in state management programs requiring supplemental stocking. The department stocks approximately 19 species and/or strains of fish each year—ranging from domestic and wild strains of trout and salmon to crappie and walleye. Turn to page 6 for "Scenes from a Hatchery Year." Serrano-Piche is a fish culturist, working from the department's Giant Springs Trout Hatchery in Great Falls. He has previously done fisheries work for the department in Libby and Fort Benton. Dotson is chief of the Fisheries Division's Hatchery Bureau in Helena. He was the manager at the Yellowstone River Trout Hatchery at Big Timber from 1977-86.

• Often adorned with bright yellow plumage, warblers are among the most brilliantly colored of Montana's songbirds. Four commonly seen in Montana include the yellow warbler, the yellow-rumped warbler, the American redstart, and the common yellowthroat. A total of 14 species of wood warblers—as they are officially known—breed in Montana. Each spring they migrate from their tropical wintering grounds in western Mexico (except for the yellow-rumped warbler which winters in the southwestern United States), flying thousands of miles north to breed and nest. But populations of warblers and some other songbirds have apparently declined in the eastern part of the country; some of the reasons explored by **David N.B. Lee** include loss of temperate and tropical forests, cowbirds taking over songbirds' nests, and increased predation on nests by skunks, raccoons, and domestic cats. Turn to "Warbling Voyagers of the West" on page 15. Lee is a free-lance writer living in Bozeman. He holds both bachelor's and master's degrees in biology, and one of his special interests is tropical ecology.

• Most fishermen don't even think of it—fishing right from a state fishing access site. But **Stan Dietz** urges you to think about "ACCESS-ible Trout." He has become convinced that public access sites offer some outstanding fishing that is often overlooked and underrated. As he writes, "Today...I do most of my angling at fishing access sites, often choosing them over float fishing or private lands on which I have permission to fish." He provides some tips for fishing at access sites, and also comments on their value: "We are indeed fortunate to have these sites, since without them, access to many of Montana's blue ribbon trout streams would not be available to the public." Dietz, who lives in Columbus, has lived in Montana for 10 years and been a trout fisherman for over 30. He notes, "When I'm not practicing my occupation as a journeyman plumber, most of my spare time is devoted to angling for trout." His article begins on page 19.

• After reading **Sis Ketcher's** article, you might comment, "What a way to spend a summer!" She spent last summer as an intern in the Parks Division, and her assignment included Big Arm and Elmo State Recreation areas and Wild Horse Island State Park. So she could become a "Companion in the Adventure" of the visitors, she had to "learn it all," to become as knowledgeable as possible about the area's plants, wild creatures, history, landmarks, and much more. She wrote and produced a program for kids, put together a trunk for "show and tell" talks, took the microphone on the tour boat, and even wrote an "Animal Foods Song." Turn to page 24 for her article, which is also accompanied by some Ketcher-produced pen-and-inks of the experience. She is an artist who lives in Somers; she was graduated from the University of Montana, with honors, in recreation management. She is presently a candidate for the Peace Corps.

• Every year, Montana's parks attract millions of visitors. The visitors are of all ages, and some seek quiet or awesome vistas, while others want to wind surf or water-ski. Still others want an opportunity to revisit a little piece of the past. As **Debbie Cheek** reaffirms, "At Montana state parks, your imagination sets you free." From Makoshika State Park with its fossil reminders of another time to the water-oriented opportunities at Flathead Lake State Parks, these "Treasures for Tomorrow" offer something for everyone. Cheek's parks tour begins on page 27. She is the field support supervisor for the Parks Division in Helena. She spent eight years with the department in Great Falls as a park operation specialist. She also was responsible for implementation of a statewide Parks Division volunteer program for which she received an Excellence in Performance award from Gov. Stan Stephens in 1990.

• In the words of **Steve Leathe**, "the Missouri River between Helena and Great Falls has undergone some of the most profound changes of any blue ribbon trout stream in Montana." The 35-mile stretch from Holter Dam to the town of Cascade has changed so much that it's almost like talking about two rivers, the old Missouri, and "The New Missouri." First of all, Leathe notes, the "good old days" weren't really all that good. For example, to meet electrical power demands, flows fluctuated daily with drastic effects on trout and aquatic insects. Then in spring of 1982, an article in a national magazine ranked this stretch among the best dry-fly waters in North America. Word traveled fast, and the 1980s proved to be a decade of tremendous change: The Missouri was discovered. Turn to his article on page 32. He is the department's fisheries manager for Region Four (Great Falls).

• *MO* thanks the following photographers and artists for their contributions to this issue: **Kristi DuBois**, **Michael** and **Patsy Fribley**, and **Conrad Rowe**, Great Falls; **Diane Ensign**, Missoula; **Lee Graves** and **Ed Tyanich**, Helena; **Charles B. Place, III**, Lolo; **Michael S. Sample**, Billings; **Bill Swanson**, Kalispell; and **Connie Wanner**, Willmar, Minnesota. Thanks also to the following contributors who work for the department: **Mike Aderhold**, Great Falls; **Gayle Joslin** and **Tom Warren**, Helena; **Barbara Thomas**, Kalispell; and **Bill Thomas**, Missoula. ■

Warbling Voyagers of the West

by DAVID N. B. LEE

AS THE FIRST RAYS OF MORNING SUN warm its body, the caterpillar begins to feed. Suddenly, a small bird appears, and in a feathered flash of yellow, devours the unsuspecting insect. Kaput! One less gypsy moth larva.

Chances are, the attacking bird was a warbler, probably one of the 14 species of the subfamily Parulinae known to breed in Montana (see "Check List of Montana Warblers"). The state's warblers are all temporary visitors, migrating to and from the tropics. Often adorned with bright yellow plumage, warblers are among the most brilliantly colored of Montana's songbirds. Wood warblers, as they are officially known, are small perching birds with thin, sharply pointed bills adapted for eating insects. Warblers are often mistaken for vireos, which have heavier, hooked bills.

Four warblers commonly seen in Montana are the yellow warbler, the yellow-rumped warbler, the American redstart, and the common yellowthroat.

The yellow warbler's Latin name, *Dendroica petechia*, is less than flattering: It means "tree dweller with red spots on skin," and conjures up the image of a monkey with a bad case of chicken pox. Actually, the red spots refer to rusty streaks on the male's breast and sides. According to the "Golden Field Guide," the yellow warbler is the only member of this family with yellow tail spots and no white plumage. In the spring, you can see these bright yellow warblers darting in and out of shrubs, willow thickets, and small trees.

The yellow-rumped warbler—known affectionately to birders as butter-butt—can be identified by its yellow cap, yellow flanks, and, of course, by its yellow rump. Its Latin name, *Dendroica coronata*, or "tree dweller with crown," refers to the yellow cap on its head. Common in Montana, yellow-rumped warblers are often seen in conifer forests, their bright yellow plumage contrasting with the green trees.

MICHAEL & PATSY FRIBLEY

Yellow-rumped warblers were once considered two separate species: the Audubon's warbler and the myrtle warbler. The Audubon's race is distinguished by its yellow throat and the myrtle by its white throat. The two species were lumped in the mid-1970s, but many birders still choose to recognize the separate subspecies.

The common yellowthroat can be identified by its repetitive song, "wichity, wichity, wichity." It's abundant in Montana, but difficult to see. Males have a unique black mask and females a bright yellow chin, throat, and breast.

Aptly named *Geothlypis trichas* or "ground thrush," yellowthroats spend much of their time on the ground or in low bushes near streams and ponds.

MICHAEL & PATSY FRIBLEY

Often adorned with bright yellow plumage, warblers are among the most brilliantly colored of Montana's songbirds.

This low-altitude lifestyle seems to get them into some nasty situations. One was found in the stomach of a three-pound bass, and another was observed stranded in a spider's web.

If you are walking through the woods or along a cottonwood-lined stream and see a small black and orange bird madly chasing after flies, it's probably an American redstart, *Setophaga ruticilla*, or "insect eater with red tail." They are easily identified by their long black tails spotted with red or orange. Redstarts are common in deciduous trees, especially near water.

BIRD MIGRATION IS ONE OF THE MARVELS of nature, and Montana warblers are masters at long-distance journeys. With the exception of yellow-rumped warblers which winter in the Southwest, Montana warblers migrate to and from the tropics. Each spring they migrate from their tropical wintering grounds in western Mexico and fly thousands of miles north to breed and nest. According to University of Montana ornithologist Dr. Richard Hutto, yellow-rumped warblers are usually among the first spring arrivals, showing up in mid- to late April. By mid-May, the bulk of Montana's warblers are in the state. Most spend only a few months here, hurriedly breeding, raising young, and preparing for the long flight back to the tropics.

Why do warblers migrate and risk a long, dangerous journey, flying through storms and dodging airplanes, towers, and tall buildings? The obvious answer is to escape the cold, but many small birds, like chickadees, have no problem surviving in cold weather. According to Hal Harrison, author of "Wood Warbler's World," they migrate to go home.

Most scientists think warblers evolved in the tropics. Later, they began migrating north as a means of increasing their breeding success by escaping competition from tropical neighbors and by taking advantage of the huge spring "outbreaks" of insect larvae.

Researchers need more and better information to document changes in migratory songbird populations and to explain any possible declines. Hutto says long-term songbird surveys are few and far between. Christine Paige, a graduate student at the University of Montana in Missoula, analyzed existing Breeding Bird Survey data and found declines in about a dozen western songbirds, including the yellow-rumped warbler. But Hutto notes these surveys may not be entirely reliable because the information is so spotty for the West.

Hutto is researching migratory birds in Mexico and has found that some species occur in fairly undisturbed tropical forests, but he notes that about 80% of migratory species are more abundant in disturbed areas. "We can't necessarily point a finger at the tropics as a cause of bird declines," he adds, "because we're doing precisely the same thing [deforestation] here in Montana that we're doing in the tropics. Almost certainly, deforestation in Montana is having as much an impact on migratory birds as is deforestation in the tropics."

Western warblers are nocturnal migrants, stopping during the day to feed and to store enough energy to get them through the night. Warblers fly south along the Rocky Mountains and cover about 100 miles a night, according to Hutto. It takes them a month or two to cover the distance between their tropical wintering grounds and Montana.

But how do birds navigate at night and without landmarks? Experiments with warblers in planetariums demonstrate an amazing ability for celestial navigation. Although the mechanism isn't well understood, warblers apparently have an internal "clock-compass" which allows them to navigate by the stars while compensating for the earth's rotation.

Warblers that survive the difficult journey from Mexico to Montana immediately turn their attention to claiming territories, breeding, and raising a family.

Males arrives first, in mid- to late May, establish territories, and sing to maintain them. The females arrive a few weeks later and quickly find a mate. Because the females don't sing, they are generally less conspicuous. Most warblers are annually monogamous, meaning they have only one mate during the breeding season, but change mates every year. After a brief courtship—these birds don't have time for a long romance—the female builds a nest, which, depending on the species, can be located anywhere from a hole in the ground to the top of a tall tree. She soon lays four to five eggs which hatch in 11 to 14 days. The chicks develop rapidly and are ready to migrate in two weeks.

According to Dennis Flath, Department of Fish, Wildlife & Parks nongame biologist, most songbird chicks, including warblers, suffer a mortality rate of 80% to 85% in their first year. If they survive this first year, their chance of living to a ripe old age of 4 or 5 greatly increases.

Most warblers, along with many other types of songbirds, are victims of parasitism by brown-headed cowbirds. These

Opposite page: A male yellow warbler feeds its young.

drab-colored birds lay their eggs in warblers' nests, often ejecting the rightful chicks-to-be. Locked into programmed behavior called a fixed-action pattern, female warblers instinctively incubate and feed any chicks in their nest, including those of the cowbird. The invading chicks are larger and more aggressive than warbler chicks and succeed in usurping the young warblers' share of the food. Those warbler chicks that aren't pushed out of the nest usually die from malnutrition. A single cowbird hen can lay an egg in each of 20 warbler nests, wreaking widespread havoc.

MICHAEL & PATSY FRIBLEY

Warbler eggs hatch in 11 to 14 days.

Cowbirds seem to be increasing and, according to John Terborgh, an eminent ornithologist, cowbird parasitism, combined with loss of temperate and tropical forests and increased predation on nests by skunks, raccoons, and domestic cats, could explain why warblers and some other songbirds have apparently declined in the eastern part of the country. Terborgh writes, "...we seriously face the prospect that suitable habitat will no longer be available for many migrant [bird] species by the end of the century."

AFTER READING ABOUT THESE BIRDS, you are probably ready to see them. Beginning in late April and with the help of binoculars, you can watch warblers feeding, making nests, and raising young in a variety of habitats. Warblers prefer lake, pond, and stream edges, but you can also see them along the borders between meadows and forests. The best time to observe warblers is in the early morning. You'll probably see more warblers and other birds if you walk quietly and wear drab-colored clothing.

A good way to learn about and identify birds is to go with people who know them well; contact the Montana Audubon Council, 324 Fuller Avenue, Helena, MT 59601 for information on bird-watching clubs in your area.

You can also see warblers without leaving home. Stephen Kress' book, "The Audubon Society Guide to Attracting Birds" is full of helpful tips for luring all kinds of birds to your yard. According to Kress, warblers rarely visit bird feeders, but they can be enticed to your home with the help of a bird bath. Although warblers prefer to bathe in shady, protected places, it is best to place the bath at least 15 feet away from bushes to deter cats and other predators from snacking on bathing warblers. The bath should be no more than three inches deep with gently sloping sides, and at least three feet off the ground.

Creating motion on the surface of the bird bath will greatly enhance its attractiveness to warblers and other songbirds. Hang a leaky bucket above your bird bath; nearby songbirds will be drawn to the dripping water. Various commercial "drippers" are also available.

On a chilly September evening, a large flock of warblers takes flight, disappearing into a darkness broken only by starlight. Guided by the Big Dipper and their internal compasses, the flock will journey south to its ancestral home. Some will die along the way, but in a few months most will be in the warm tropics. A warbler's life is short and difficult, and the changes people are making to the warbler's habitat aren't making life any easier. The future of these amazing voyagers is in our hands, and only by making a concerted effort to protect habitat for warblers—habitat in their wintering and summering grounds and also along their migration routes—can we ensure their continued existence.■

For More Information ...

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Kress, Stephen, "The Audubon Society Guide to Attracting Birds," Charles Scribner's Sons, New York, 1985.

Robbins, Chandler, et al., "A Guide to the Field Identification of Birds of North America" (Golden Field Guide), most recent edition.

Terborgh, John, "Where Have All the Birds Gone?" Princeton University Press, New Jersey, 1989.

A Check List of Montana Warblers

- Tennessee warbler *(Vermivora peregrina)*
- Orange-crowned warbler *(Vermivora celata)*
- Nashville warbler *(Vermivora ruficapilla)*
- Yellow warbler *(Dendroica petechia)*
- Yellow-rumped warbler *(Dendroica coronata)*
- Townsend's warbler *(Dendroica townsendi)*
- American redstart *(Setophaga ruticilla)*
- Ovenbird *(Seiurus aurocapillus)*
- Northern waterthrush *(Seiurus noveboracensis)*
- MacGillivray's warbler *(Oporornis tolmiei)*
- Common yellowthroat *(Geothlypis trichas)*
- Wilson's warbler *(Wilsonia pusilla)*
- Yellow-breasted chat *(Icteria virens)*
- Black-and-white warbler *(Mniotilta varia)*

—from Skaar, P.D., D. Flath, and L.S. Thompson, "Montana Bird Distribution," Montana Academy of Sciences Monograph No. 3, 70 pages, 1985.

ACCESS-ible TROUT

by STAN DIETZ

DARK CLOUDS GATHERED over the mountains to the west as I drove south from Ennis along the Madison River. It was late July and I'd been looking forward to this fishing trip for many years. But there was one problem: I was a newcomer to Montana, unfamiliar with the area, and I was having trouble finding a place to fish.

When I saw a sign along the highway marking a state fishing access site, I remember thinking, "Since this is a public access, it's probably overfished and there won't be many trout here." But I turned onto the gravel road anyway, and when I reached the parking area after a short drive I was pleasantly surprised to find only one other car there. It looked as though I was going to have the river pretty much to myself. Anxiously, I assembled my rod, donned waders and vest, and headed for the river.

During the next hour I gradually worked my way downstream, catching and releasing several rainbow trout rang-

DIANE ENSIGN

ing in size from one to two pounds. As the wind picked up and a light rain started falling, I made my way through a stand of willows. There, tucked away in the thicket, was a small eddy no more than two feet in depth. After stripping eight or nine feet of line through the guides, I carefully held my rod at arm's length, dapping the fly on the surface of the water. The elk hair caddis sat poised, bobbing around for a few seconds.

What happened next took me totally by surprise. A big brown trout rose slowly, jaws agape, and inhaled my fly. When I set the hook, he raced toward the middle of the river into heavy current. I'd rather not recall the scene that followed, but after a brief struggle the leader broke and the battle was over as quickly as it had begun.

I stood there a moment cussing myself for not having used a heavier leader. To make matters worse, it began raining so hard that within minutes I was soaked to the skin. One glimpse at the sky told me the rain wasn't about to let up, so I decided to pack it in for the day. Disappointed, I trudged the quarter of a mile back to the parking area.

It hadn't been a very successful trip, especially after losing a trophy fish and getting rained out. But during the long drive home, I had plenty of time to reflect on the day's events. My thoughts drifted back to the big brown that had separated my leader, then some questions crept into my mind: Could more opportunities for big trout be waiting at other state fishing access sites? Maybe...but if good fishing existed at these sites, why weren't more people fishing there? These questions and many others were to be answered in the years to follow.

BILL THOMAS

THE FOLLOWING WINTER seemed endless, but my weekends were filled with useful tasks, one of which was tying flies for the coming season. With each passing month the days grew longer, until the rivers finally were free of their icy shells. Spring's arrival found me with a new enthusiasm sparked by the previous year's discoveries.

I spent a day early that May fishing one of my favorite stretches of the Yellowstone River in scenic Paradise Valley. I started fishing at daybreak and caught a fair number of trout over the course of the day, so I decided to quit a little early. On my way home to Big Timber on Interstate 90, I passed by the village of Springdale, where a fishing access site is located next to a river bridge. Since I had another hour of daylight, I figured I'd stop and fish until dark. The parking area was devoid of vehicles as well as other fishermen.

As I stood readying my equipment, golden sunlight filtered through the cottonwoods. The air became very still, signaling that magic time of evening when you expect something to happen at

any minute.

I searched the water for any sign of feeding activity. Suddenly, a splashy rise near a bridge pier caught my attention. In the shadows I could see caddisflies hovering over the water, while others were clinging to the underside of the bridge. I quickly tied a No.14 trude to my tippet and began fishing upstream, picking up a few small browns and rainbows along some rip-rap underneath the bridge.

Approximately 100 feet farther upriver, some crumbling cement piers marked the remains of an abandoned bridge. As I studied this section of water, I couldn't believe my eyes—in the swirling waters of an eddy behind one of the old bridge piers, dozens of trout were rising to a heavy flight of caddis. The fish were slashing at the flies with reckless abandon.

I began casting excitedly, and as soon as my fly touched the water a sassy rainbow grabbed it and went skipping across the surface. Within minutes I led him to shore, gently slipping the hook from his mouth. For the next hour, action continued at a rapid pace; I caught and released one trout after another, over 20 fish in all, some of them cutthroats weighing more than a pound.

As the light faded it became harder and harder to see, and I finally snapped my fly off in the tall grass behind me, putting an end to fishing for the day. With a great feeling of satisfaction, I reeled in the slack line while the trout kept feeding noisily in the dark. Walking back to my pickup I thought, "Not bad for an hour of fishing and only having to walk a hundred feet or so."

AFTER THAT EXPERIENCE and many similar ones, I became convinced that public access sites offer some outstanding fishing which is often overlooked and underrated. Today, nearly 10 years later, I do most of my angling at fishing access sites, often choosing them over float fishing or private lands on which I have permission to fish. While some sites are better than others, most of them provide, at the very least, fair fishing. With today's reduced limits and more people practicing catch-and-release, rivers throughout Montana maintain stable trout populations even where fishing pressure is moderate to heavy.

"Today. . . I do most of my angling at fishing access sites, often choosing them over float fishing or private lands on which I have permission to fish."

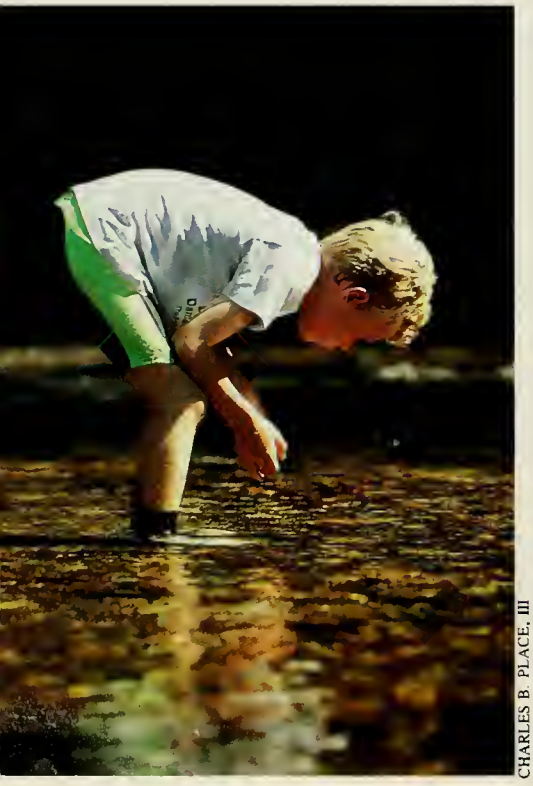
When choosing a site to fish there are no specific rules to follow. Most anglers base their choice on the type of water they prefer. Of course, fishing success will vary with time of year, weather, water conditions, and a host of other factors. If you aren't familiar with the river you plan to visit, it's a good idea to check with a local tackle shop. The proprietor can tell you which flies or lures are best for the time of year and the waters you intend to fish.

If you travel to a larger river such as the Yellowstone, don't be discouraged if you pull into an access site and see quite a few pickups or boat trailers in the parking area. This doesn't necessarily mean a lot of people are fishing at the site, nor does it mean boat fishermen have worked the area thoroughly. As a rule, people fishing from boats don't wet a line until they're a few hundred feet downstream of where they launched. By the same token, fishermen who have floated from upriver often quit fishing a few hundred feet above where they plan to take out. As a result,

Public access sites offer some outstanding fishing opportunities.

DAVE BOOKS

CONNIE WANNER



CHARLES B. PLACE, III

there are hundreds of feet in either direction of the site that normally don't get much fishing pressure.

It's important to take your time and fish the water carefully. Try areas where brush or willows grow right to the river's edge, and seek out obscure pockets of water next to the bank. Don't pass up stretches of river that run close to a highway, especially those with steep banks and large rocks along the water's edge. Fishermen often make the mistake of ignoring these spots, choosing instead to fish the more attractive larger pools and runs. If there's no sign of surface activity, try streamers or nymphs fished deep and slow, adding some weight to your leader if necessary.

When the action is slow, I often make a half dozen or more passes through the same water with a different fly or lure each time. I believe this increases my odds of taking trout when fishing is a little off.

Frequently, I'll spend a whole day at one access site, fishing as much as a half-mile up or downstream in the morning, returning to the parking area for a lunch break, then spending the rest of the afternoon fishing in the opposite direction. There is usually an insect hatch at least once during the day, and being on the water ensures me a chance of taking advantage of it. If at all possible, I try to stay and fish right up until dark, since this is often the most productive time of all.

Along with a lot of other Montanans, I've used fishing access sites for many years, never thinking much about their origins or where the money comes from to purchase and maintain them. We tend to take these sites for granted, assuming they've always been there, but of course that's not the case. Before the 1960s, there were no fishing access sites as we know them today in Montana.

In 1964, reorganization within the Montana Department of Fish and Game resulted in formation of a new Recreation and Lands Division. One of its charges was to develop fishing access opportunities. Then in 1977, anglers succeeded in creating a fishing access program supported by earmarked license fees. Today, the earmarked fees include $5 from the non-resident season license and $1 from each resident season and non-resident two-day license. As a result, Montana has one of the largest and most diverse fishing access site systems anywhere, with 300 sites managed to provide recreational access to the state's streams, rivers, and lakes (see "Doorways to Adventure" in the March/April 1991 issue of *Montana Outdoors*).

We are indeed fortunate to have these sites, since without them, access to many of Montana's blue ribbon trout streams would not be available to the public. And as I have discovered over the past 10 years, these sites provide more than just an entryway to public waters: They provide outstanding fishing opportunities as well.■

In 1977, Montana anglers created a fishing access program supported by earmarked license fees. Today, Montana has one of the largest and most diverse fishing access site systems anywhere, with 300 sites managed to provide recreational access to the state's streams, rivers, and lakes.

MEMORIES OF MERRIAM'S

The article by Brian Giddings in the March/April issue brought back a bunch of memories as I read about the evolution of the Merriam's turkey. I was the ranger on the Sioux District when the first season on the Montana turkey was held (1958).

But to go back a few years, I was also the ranger at the Malta LU District in 1957 when turkeys were planted at Sippery Ann Creek. I remember I was real excited about it. (Please note the "Sippery Ann." That's what all the old-timers called it and that's how it was on our maps.)

I was at Camp Crook, South Dakota, as assistant ranger, when the 1955 plant was made. We—Bill Evans, the ranger; Smokey Cunningham, the assistant; and I—spent a lot of time looking at those birds and wondering when we might be able to hunt them. There were also a lot of department people down there watching them—guys like Joe Egan, LeRoy Ellig, Wes Woodgerd, even Doc Eng. In addition, biologists from North Dakota like Jim McKenzie and Wild Freddy Priewert from South Dakota spent time looking at them, even though they already had them in the Black Hills and along the Little Missouri in North Dakota and South Dakota.

When the first season was announced, there was one drawback for us Sioux District people—we lived in South Dakota and could not hunt in the Long Pines which was in Montana but still part of our district. The season started on a Saturday, so by Friday night, we had lots of visitors from around the Custer National Forest who wanted a place to stay for a couple of nights. There weren't many places to stay in that part of the country and Camp Crook was only three miles from the Long Pines.

The state was planning to get plenty of information on the hunt, so they had check stations at all six of the entrances into the Long Pines. They also had a number of free-roaming wardens in the hills both days.

People kept asking what kind of weapon they should use for hunting turkeys. Since none of the people hunting turkeys had hunted them before, nobody seemed to know. Some carried rifles, some revolvers, and of course a lot of shotguns. There was plenty of action early in the morning, lots of shooting and lots of turkeys taken. However, by late afternoon on Sunday, 'twas hard to find anyone getting a turkey. Since this 62,000-acre area was not very big for the large number of people in its hills, there were a few incidents of people getting mad at people, but I felt it really went very well.

The turkeys were supposed to eat lots of pine nuts. But when their crops were opened, they had more little bluestem seeds in them than anything else.

I don't think there were too many crippled birds that first season. A month or so later, a well-known forest officer and I were traveling through the Pines one evening and we saw a one-legged tom hopping across the road. This officer had a .45 with him and said, "Hey Bernie, that bird won't live through the winter, will he?" I said, "I doubt it. Go get him." However, a one-legged turkey is still master of a man with a revolver, and the turkey got away.

With the fires of 1988 which burned up nearly all of the Pines, I don't know how the turkeys survived. But looking at the map in Mr. Giddings' article, they are established over the entire state and I think we will have turkey hunting in Montana as long as hunters hunt.—*Bernie Alt, Kalispell*

IS IT REALLY A MERRIAM'S?

I recently read "Merriam's on the Move" which appeared in the March/April 1991 issue of *Montana Outdoors*.

The picture on page 3 is definitely a turkey, but is it really a Merriam's?

I enjoy the magazine very much—keep it up!—*Marland Johnson, Molt*

• *Oops—we goofed. The photo in question, snapped by Dave Bennett of Kalispell, is a Montana wild turkey, but it's not a Merriam's. In the 1960s, a group of sportsmen from the Kalispell area imported some wild turkeys from Pennsylvania. These birds, which were the eastern subspecies of wild turkey rather than the Merriam's, eventually escaped captivity and established themselves in the Flathead Valley. Today, their descendants are numerous enough to support a spring gobbler season and a fall either-sex season on a permit basis.*—Ed.

A GOOD-LOOKING MAGAZINE

I think that your magazines are fun to read and look at. The animals in it are interesting.

The front covers of all the magazines are well-taken pictures. My favorite one was the Jan./Feb. Special Photo Issue with the mountain goats and bobcat pictures.

I think you should publish more issues of the magazine.—*James Kroner; Glengardner, New Jersey*

* * * * *

Regarding the most recent photo issue—absolutely AWESOME!

I also enjoyed the Charles M. Russell quotes.

You do a fantastic job of keeping us in touch with our roots.—*Mrs. D.P. Mitchell; Spokane, Washington*

* * * * *

Quite simply, your Special Photo Issue featuring Charlie Russell quotes was outstanding. You deserve a thank you from every lover of Montana and C.M.R.

How refreshing to see real ingenuity and imagination at work at a professional level. It raised the hairs on the back of my neck.

Well done, and thank you!—*Paul Reierson; Mountlake Terrace, Washington*

* * * * *

I have just finished your Special Photo issue, and the following words come to mind:

Beautiful
Inspiring
Poetic
Humbling

What a fine piece of work!—*Bill Austin; Jacksonville, Florida*

* * * * *

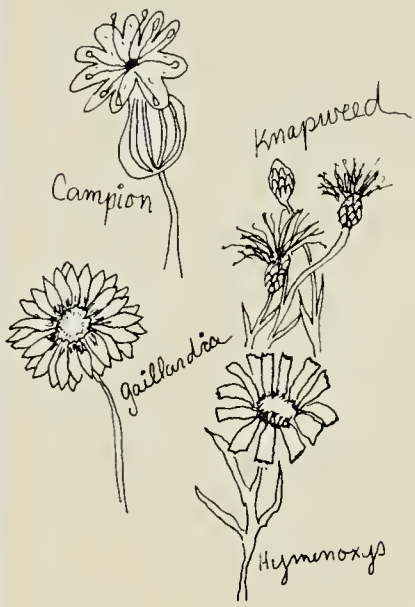
A Parks Intern's Journal

"Companion in the Adventure"

story and illustrations by SIS KETCHER

June 26

Have spent my first week becoming familiar with Big Arm and Elmo State Recreation areas and Wild Horse Island State Park, the visitors, and the campground hosts. It looks like this summer internship will be quite an experience.



While walking around Elmo, I found a family of skunks. I also took note of the flowers in bloom: gaillardia, hymenoxys, salsify, campion, thistle, and knapweed. I plan on collecting, pressing, mounting, and labeling these flowers for interpretive use. Must do some research on ground squirrels—they are very much a part of the scene in these lower Flathead Lake parks.

June 30

A magnificent early summer Saturday spent with Ole Starkey, the Wild Horse Island ranger (the man whose job everyone covets). We cruised around the island. Ole pointed out things of interest and we were ever on the alert for wildlife. Ate our lunch up in the island's saddle, where 80 years ago homesteaders built a modest home and barn. We later visited Hiawatha Lodge, focal point of a 1930s dude ranch.

Not only is Wild Horse full of wildlife, it's also full of history—and I'm going to have to learn it all so I can share it with visitors.

Before Ole and I returned to the boat, we hiked up a rise and into position where we could see an eagle's nest. Two eaglets joined the island wildlife this year. We saw both parents and the young in their immense nest—an unforgettable sight.

BULLETIN BOARD
Kids Program
SATURDAY 11:00 A.M
• walk + talk through the park with a naturalist
• learn about the animals and what they eat
• meet at picnic shelter
• lasts about 1 hour
Rain or Shine
WELCOME TO MONTANA'S STATE PARKS
Sketcher

Wild Horse Island is so peaceful and so full of nooks to explore that I can't wait to go back and poke around. I'm particularly interested in the grass that covers a good portion of it; it's one of the Palouse Prairie plants. Wild Horse Island

is one of the best examples of this type of habitat.

July 7

Have begun laying the groundwork for several projects. I've spoken with the operator of the tour boat Polson Princess, a 40-foot cruiser which does a daily three-and-a-half hour Flathead Lake tour out of Polson Bay and around Wild Horse Island. Once a week, I will be speaking to the visitors as we travel around Wild Horse, interpreting the wildlife we see along the shores and filling in historical information about the island.

Took the cruise last week and enjoyed roving about the boat, visiting with passengers and answering as many questions as I could about the Flathead area.

The Polson Museum has become a wonderful source of information about the past: news articles, personal journals, travel brochures, and old photographs help me piece together a more vivid picture of life around this lake. My research is also supplemented by wonderful formal and informal publications in local libraries.

Another productive and fascinating source of information comes from oral histories. Erika Nakamura, a Green Thumb employee working for the Department of Fish, Wildlife & Parks has collected several oral histories from residents of the lakeshore (Green Thumb is a federally sponsored employment program for older workers). I've also been scrounging through office files. I'm grateful to have use of tapes made through a 1987 Montana Historical Society project; from them, I learned of early steamship activities on the lake.

I'm trying to think of ways to present this information to visitors, hoping they will find it as fascinating as I do. This is just like being in school—research is fun, but putting it all together is the challenge.

Next week, I talk to a bus tour at Elmo State Recreation Area (S.R.A.) and will take the microphone aboard the tour boat.

July 12

My special project during this internship is creation of an Interpretive Trunk. This idea comes from the University of Montana's Wilderness Institute. Their trunk contains all sorts of props, materials, and literature concerning endangered species in the Rocky Mountains. My trunk will have items pertaining to local, natural, and human history in it. I'm excited about it, and I'm also pleased that I've acquired the skills to carry the trunk through design, construction, and filling it up with treasures.

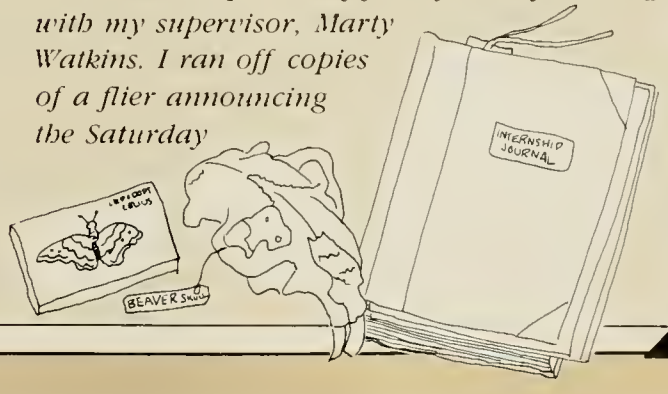
The trunk—24x15x16 inches—is a plywood structure with a hinged lid. I think of it as a traveling visitor center. Handles allow one person to carry it into campgrounds, parks, classrooms, or meeting halls. I hope it will find its way to a variety of places. I'm staining it today and will paint the state park logo on it next week.

August 2

A new month and a busy couple of days. Yesterday I worked at my desk all day, researching and writing the kids' program I will introduce Saturday morning at Big Arm S.R.A.

The program is about commonly seen animals at Big Arm and what they eat. We will walk through the park and end the walk with a song I made up. I'm limiting the participants to 5 years old and up.

Was in Kalispell today for my weekly meeting with my supervisor, Marty Watkins. I ran off copies of a flier announcing the Saturday



morning program for kids. I'll give them to the gate attendant at Big Arm to distribute to visitors entering the park. Al Elser (who was supervisor for the Kalispell region at that time) walked into the office as I was demonstrating my "Animal Foods Song" to Marty. They both think I'm a little off the wall, but they're enthused about my kids' program.

I gave my first talk to a bus tour group at Elmo S.R.A. The group seems to enjoy this lunch-time stop on their "nine-day northern Rockies blitz" out of Calgary. The majority of the people are from Australia and Great Britain. Since they enter the valley via Highway 28, this is their first encounter with Flathead Lake and the incredible Mission Mountains to the east. As they picnic, they have a chance to leisurely view these incredible surroundings, contemplate the beauty, and maybe even take a dip in the lake (as three of the younger guests did today).

After they lunched and relaxed, their tour leader asked them to assemble in the coolness of the pavilion where I talked to them for about 20 minutes. I hope I made their visit to the shores of Flathead Lake a little more memorable. I talked about the forces which formed the lake and surrounding terrain. A large plywood map I had put together helped them with orientation.

The existence of the Flathead Indian Reservation is of great interest to most visitors, so my program included a bit about its formation and about the tribes.

To close the program, I called everyone's attention west to the dramatic backdrop provided by Chief Cliff, a rock formation about 150 feet high prominent from Elmo S.R.A. I related the Chief Cliff legend as I found it in "Northwest Indian Legends." The legend tells how an aged Kootenai chief rode his horse over the edge of the cliff in an effort to remind the younger members of the tribe of the bravery and wisdom of their grandfathers. He felt the young people were not respectful of their elders and that they were neglecting the Kootenai ways. Although I think my talk was well received, I'm glad to have gotten this first program out of the way—it's always kind of scary.

August 11

Just finished my second Saturday morning kids' program in Big Arm. They especially enjoy walking around the park and discovering things. We sat under a classic owl roosting tree and I talked about the kinds of things owls eat. I showed the kids some owl pellets and explained what they were (the fur and bones of the owl's prey cannot be digested, so about 12 hours after eating, an owl coughs up the undigested remains). One little boy volunteered, "My brother throws up a lot too." What can you add to that?

We moved on to become members of the "Mud Puddle Club" by observing butterfly activities at the local mud puddle. It's a good way to observe Lepidoptera and their preference for the water and minerals in puddles.

The kids were reluctant to sing the song I made up, so we did it as a poem. The kids filled in the rhyming word at the end of each line.

August 23

"The interpreter is not primarily a teacher, but a companion in the adventure." I've been reading Freeman Tilden's book, "Interpreting Our Heritage." I guess I'm looking for some guidance in this business of interpretation. Sometimes I feel a little confused about what I'm trying to accomplish with these programs and acting as a "companion in the adventure" feels pretty comfortable to me.

The season is coming to a close, and my completed internship will provide the final credits for my degree in recreation management at the University of Montana. This 400-hour practicum is part of the requirements—but what a way to spend a summer! My excursions to Wild Horse on the Polson Princess have gotten more and more satisfying. I hope I am really helping people have the best experience possible. But I also hope I am piquing their curiosity, provoking some thought, and fostering appreciation of the abundant natural resources Flathead Lake has to offer. ■

Bannack by Lee Graves

treasures for tomorrow

Every year, millions of people of all ages and interests visit Montana's state parks. Some seek quiet relaxation, while others seek fun and vigorous recreation. Some want to relive a part of Montana's history, while others enjoy Montana's unique treasures of clean water and breathtaking scenery. But whatever the reason—Montana state parks have something for everyone.

You will find those who have left behind daily cares and burdens. You will see a family picnicking, a young boy catching his first fish, friends water-skiing, a group of wind surfers, a family camping, teen-agers hiking, explorers who have come to revisit some of their history, children awed by glimpses of wildlife. At Montana state parks, your imagination sets you free.

The state has magic places that are well known: Lewis and Clark Caverns, Montana's first and best

Makoshika

Medicine Rocks by Kristi DuBois

Missouri Headwaters by Connie Wanner

Mule deer by Bill Swanson

known state park, features one of the most highly decorated limestone caverns in the Northwest. Naturally air conditioned, these spectacular caves, lined with stalactites, stalagmites, columns, and helictites, are like a walk through another dimension.

Within Makoshika State Park lie the fossil remains of another time, another world. Dinosaurs such as tyrannosaurs and triceratops once called this "badland" home. This incredible 8,000-acre park is

Flathead Lake by Diane Ensign

Giant Springs

Lewis and Clark Caverns

studded with unusual formations, nature trails, and scenic roads.

Bannack State Park, the Montana Territory's first capital, is a place where history comes alive within the endless territory of the imagination. The main street is lined with historic log and frame structures that recall the discovery of gold in Montana, the vigilantes, and other bits of the state's rich history.

Giant Springs, one of the largest freshwater springs in the nation, was discovered in 1805 by the Lewis and Clark Expedition. Visitors can picnic on the banks of the Missouri River, visit the nearby Rainbow Falls overlook, tour the Visitor Center, or enjoy the fish hatchery.

Flathead Lake State Park comprises seven scenic areas, each offering a variety of activities. Visitors can boat, swim, boardsail, sunbathe, camp, picnic, fish, water-ski, or watch birds. They can also take nature walks, try their hand at photography, or just relax.

The state also offers some not-so-well-known places that provide sanctuary: special treasures like Missouri Headwaters, where the Jefferson, Madison, and Gallatin rivers converge to form the Missouri River. Placid Lake, on a branch of the Clearwater River famous for its trout and kokanee salmon fishing. Madison Buffalo Jump, a pishkun thousands of years old where visitors can relive the excitement and drama of the buffalo jump.
The 61-mile float trip down the remote Smith River Canyon with its

Wild Horse Island by Barbara Thomas

Pictograph Cave by Connie Wanner

Madison Buffalo Jump by Michael S. Sample

incredible scenery and fantastic trout fishing. The Pictograph Cave complex, home to generations of prehistoric hunters, where a paved quarter-mile trail allows visitors to view the ancient rock paintings.

Montana state parks are for families; they're for the curious, and for those seeking a few hours of quiet. Come, see, learn, enjoy, dream, recall, relax—there's something for everyone.—Debbie Cheek, Parks Division, Helena■

THE NEW

by STEVE LEATHE

IN THE PAST 20 YEARS, the Missouri River between Helena and Great Falls has undergone some of the most profound changes of any blue ribbon trout stream in Montana. It has changed so much, in fact, that it's almost like talking about two rivers, the "old" Missouri and the "new" Missouri.

EVOLUTION

Comparing the old and new Missouri Rivers, it's apparent that the good old days weren't really so good. Before 1974, river flows below Holter Dam fluctuated a great deal on a daily basis, sometimes from as low as 1,000 cubic feet per second (cfs) to as high as 7,000 cfs. These drastic fluctuations, timed to meet daily changes in electrical power demand, had damaging effects on trout and aquatic insects.

Perhaps the most important milestone in the birth of the "new" Missouri was reached in the early 1970s when upstream dam operators (Montana Power Company and the Bureau of Reclamation) worked cooperatively with the Montana Department of Fish, Wildlife & Parks (FW&P) to stabilize river flows. This cooperative relationship made possible a tremendous improvement in the quality of the Missouri River trout fishery. Representatives of each of

KRISTI DUBOIS

these groups now meet each spring to discuss runoff forecasts, anticipated reservoir operations, and flow releases.

At about the same time, another change was taking place that would have far-reaching impacts on the trout fishery. The "old" Missouri had been managed since the 1930s by stocking 20,000 to 50,000 hatchery rainbow trout each year. But in the early 1970s, stocking of rivers and streams was discontinued statewide when studies showed it to have detrimental effects on wild trout. This change in management philosophy, along with stabilized river flows, allowed the Missouri to become one of the premier wild trout fisheries in the country.

DISCOVERY

As FW&P biologists refined population census techniques on the Missouri in the early 1980s, scientific data confirmed what local anglers already knew: The Missouri had developed into a world class trout fishery. The news of extraordinary numbers of fish per mile began to spread, first through word-of-mouth and then through published accounts. The fishery received national attention when an article by Gary LaFontaine entitled "The Missouri Nobody Knows" came out in *Fly Fisherman* in spring of 1982. He reported the stretch below Holter Dam was "almost unknown except to local fly fishermen" and ranked it among the best dry fly waters in North America.

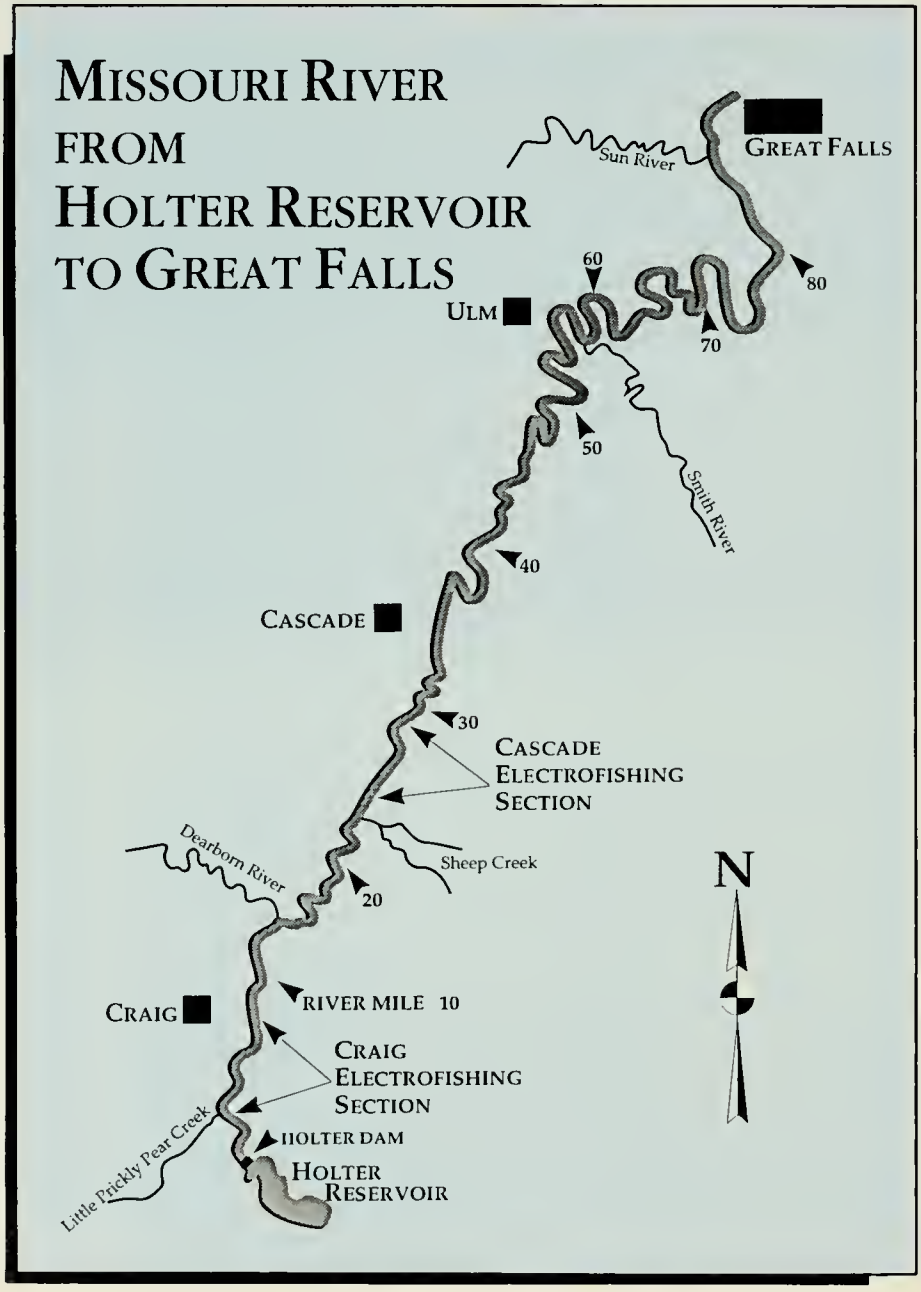
Fisheries biologist Rod Berg substantiated this claim when he published the findings of a special FW&P research project in a 1984 *Montana Outdoors* article called "Trout Heaven" (see Sept./Oct. 1984 issue). He discovered populations of 2,000 to 3,000 catchable trout seven inches and larger per mile of stream, including at least 20 to 100 trophy trout 18 inches and larger per mile. By 1985, the Missouri River trout fishery was no longer a well-kept secret.

The New Missouri

When I first fished the new Missouri one evening in 1984, I vividly remember being impressed...and humbled. The tactics that had worked so well on aggressive cutthroat trout in rivers west of the Divide were simply no match for the Missouri's selective rainbows. The river itself, although large, was remarkably gentle. White pelicans loafed contentedly on islands while big, hyperactive rainbows discreetly sipped tiny caddisflies and mayflies in backwaters and side channels. The productivity of the river was astounding. It was like one gigantic spring creek, complete with luxuriant weed beds, dizzying evening caddisfly hatches, and towering columns of *Tricorythodes* mayflies (tricos) that coated the entire river some mornings. I hoped that one day I'd have the opportunity to work on this prolific river and perhaps uncover a few of its secrets.

My chance came in the spring of 1986, when I was assigned to FW&P's Region Four headquarters in Great Falls as a fisheries biologist. It wasn't long before I realized that things had changed on the Missouri and that there were signs of trouble in paradise. Statewide mail surveys showed that angler use on the Missouri had increased by at least 50% in 1984 and remained high thereafter. Only the Madison River received more fishing pressure, but use there was distributed over 88 river miles versus the 35-mile Missouri River reach. People were beginning to complain about crowding and express concerns that increased use was causing trout populations to decline. River flows dropped below 3,000 cfs in the summer of 1985, which proved to be the first in a series of drought years. Anglers began to worry about the effects of low river flows on trout populations.

Fortunately, we had an excellent database from the early 1980s to use as a reference. Department efforts since 1986 have focused on monitoring trout populations, protecting fish habitat on the river and its tributaries, determining angler use and success, evaluating impacts of angler harvest and drought, identifying spawning areas, and developing an overall management plan for the fishery.



Spawning

Investigations of rainbow spawning runs have provided some of the most exciting and surprising information gathered during the past five years. Earlier work had indicated that rainbows spawn in the river and in a few tributary streams, but the relative importance of these areas was unknown. In spring of 1986, we placed a fish trap in Sheep Creek, one of the smallest of the spawning tributaries (see map). Results were enlightening: More than 4,000 Missouri River rainbows, averaging 16 inches in length, spawned in the creek. This was quite a run for a stream less than 10 feet wide in most places.

We returned to Sheep Creek in 1987 with better trapping equipment, thanks to a donation from the Missouri River Flyfishers Club. The results confirmed what we had observed the year before—around 3,500 rainbow spawners used the creek. We tagged nearly 700 of these fish in an attempt to find out where they live during the remainder of the year. Subsequent tag returns from anglers that summer indicated most Sheep Creek spawners live in the river from four miles upstream to 15 miles downstream of the mouth of Sheep Creek.

Some tagged fish were caught all the way downriver to Great Falls, indicating Sheep Creek is important for trout residing through a 50- to 60-mile stretch of river.

The 1986 and 1987 results prompted us to wonder how many fish might be using major tributaries like the Dearborn River and Little Prickly Pear Creek. High water during spring in these larger streams normally makes fish trapping impossible. Ironically, the drought helped us out. Flows in the Dearborn during spring of 1988 were the lowest on record and the trapping results were stunning: An estimated 20,000 fish used the Dearborn, and another 15,000 used the Little Prickly Pear and several of its tributaries. We found some spawners more than 40 miles up the Dearborn. Later tag returns indicated Dearborn spawners spend most of the year in the Missouri roughly 15 miles on either side of the mouth of the Dearborn. Little Prickly Pear Creek spawners were found later mostly in the first 10 miles of river below Holter Dam. A helicopter survey of the Missouri itself confirmed that somewhere around 90% of rainbow spawning occurs in tributaries. Thus, the health of the Missouri River rainbow trout fishery is inextricably linked to habitat quality and stream flows in the tributaries.

Less is known about brown trout reproduction. Fish trapping in 1988 revealed substantial use of Little Prickly Pear Creek but little or no use of the Dearborn River by spawning brown trout. Use of smaller tributaries like Sheep Creek is probably limited by low flows in the fall. Studies in the early 1980s also identified several brown trout spawning areas on the mainstem river with particularly heavy use of side channels. Mainstem spawning areas appear more important to browns than to rainbow trout.

Angling Trends

We conducted a special project in 1986 to determine the effect of increased angling pressure on trout populations. We selected the 5.6-mile section between Wolf Creek bridge and Craig because it is one of the most heavily fished stretches and it has high trout populations. Also, we had trout population data on this stretch for each of the previous three years.

Survey results revealed that fishing pressure totaled about 1,100 angler-days per mile annually, making it similar to the upper section of the Bighorn River near Hardin. The new Missouri indeed had become one of the most crowded rivers in Montana. However, catch rates were excellent (0.61 trout per hour) and average size of harvested trout was large: 15.0 inches for rainbow and 15.2 inches for brown trout. Approximately 15% of the rainbow trout population was harvested during the main fishing season, while nearly 30% of the brown trout population was creeled. While we considered the rainbow trout harvest acceptable, we felt the brown trout harvest was too high.

Creel survey data confirmed that conversion to a wild trout fishery was a total success. By the late 1980s, anglers were harvesting around 40,000 rainbows each year from the river with no apparent harm to the fishery. Before 1973, the department stocked 20,000 to 50,000 rainbows each year—often less than the number now being harvested without stocking! Catch rates were also higher in the 1980s after stocking was discontinued (see Table 1).

Comparing harvest rates from 1987 with those from 1980 and 1981 helps explain how trout populations have been able to withstand the increased fishing pressure. Catch rate includes fish kept as well as those released, while harvest rate includes only fish that are kept. Although catch rates for 1987 were as high as or higher than those in previous years, harvest rates decreased by almost 50% between the early 1980s and 1987. In 1980 and 1981, anglers consistently kept 80% of the rainbows and 50% of the browns they caught, while in 1987 they kept only 35% of the rainbows and 25% of the browns. This voluntary catch-and-release behavior was paralleled by a significant change in fishing methods. In 1980-81 only about 15% of the anglers surveyed used artificial flies and lures exclusively, but in 1987 this figure increased to 39%. Thus, greater use of artificials and the adoption of a voluntary catch-and-release philosophy by many anglers explains how trout populations have been able to withstand increased fishing pressure on the Missouri.

Trout Populations and River Flows

Monitoring trout populations on the Missouri River is hard work. Biologists spend hundreds of hours on electrofishing boats between dusk and dawn 15 to 20 nights during spring and fall. Thousands of trout are netted, weighed, measured, marked, and released each year. Scale samples are taken from hundreds of fish to determine age and growth. The work has really only begun when the field work ends: Reams of data are entered on computer, fish scales are mounted on plastic sheets and examined under microscopes, and boats and gear are repaired and maintained. Eventually all the information is com-

Fish Caught per Hour

Year	Rainbow	Brown	Total
1949	0.22	0.07	0.29
1970	?	?	0.32
1971	?	?	0.35
1980	0.36	0.01	0.37
1981	0.39	0.02	0.41
1987	0.42	0.04	0.46

TABLE 1. Trends in average catch rates (fish per hour) by anglers on the Missouri River from Holter to Ulm.

bined, analyzed, interpreted, and reported.

The Missouri is primarily a rainbow trout river. The number of rainbows longer than 10 inches averages 2,700 per mile near Craig and 910 near Cascade. Brown trout are much less abundant, averaging 300 and 220 fish (10 inches or more in length) per mile near Craig and Cascade, respectively. As Rod Berg pointed out in his 1984 article, few Montana rivers or streams support as many large trout.

A number of factors influence trout populations in the Missouri, but river flows, spawning tributary flows, and harvest by anglers are the most critical. Because most river side channels have adequate flows when river discharge exceeds 4,100 cfs, this is the department's recommended minimum flow. During recent drought years, however, it hasn't always been possible to meet this target. Late summer flows dipped below 4,100 cfs in only two of the 15 years before 1976, but did so in nine of 14 years after 1976.

The department has recommended an emergency minimum flow level of 3,000 cfs for drought years. Studies have shown that at flows above 3,000 cfs most of the productive riffle areas of the main river channel remain wetted, although side channels become marginal. As river flow drops below 3,000 cfs, main channel riffle areas are rapidly lost. Fortunately, late summer flows have been maintained above 3,000 cfs in recent drought years, due largely to the cooperative efforts of the Bureau of Reclamation, Montana Power Company, and FW&P.

The Missouri is perhaps best known for its ample numbers of large, scrappy rainbows in the 14- to 17-inch size range. Although rainbows of this size have sustained themselves fairly well in recent years, the effects of drought can be seen rippling through the population (see Figures 1 and 2). Extremely low water in 1987 and 1988 led to poor numbers of 7- to 11-inch rainbows in both the Craig and Cascade study sections in 1988 and 1989. The Craig section is representative of approximately the first 10 river miles below Holter Dam, while the Cascade section

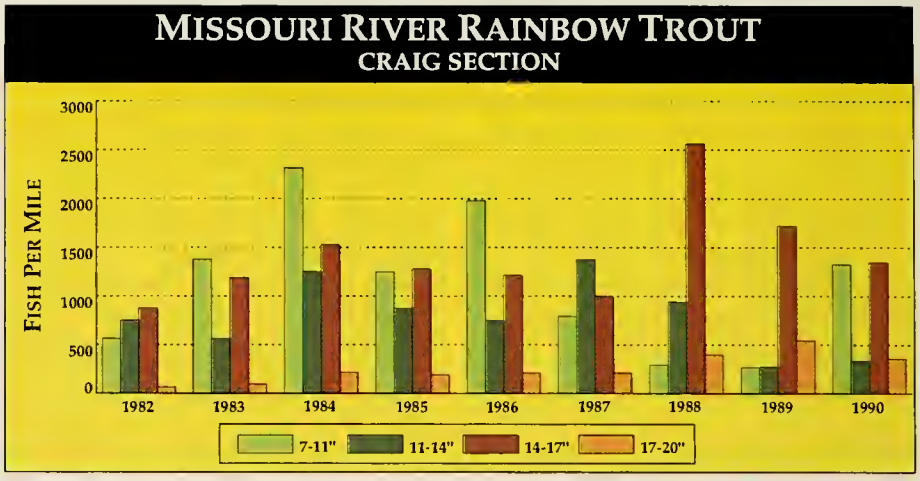


FIGURE 1. Number of rainbow trout per mile in the Craig section.

is more indicative of the lower 25 river miles down to Cascade. Numbers of 11- to 14-inch fish were correspondingly low in 1989 and 1990 as the weak rainbow year classes moved through the population.

Fortunately, spawning tributary flows were excellent in 1989, leading to substantially improved numbers of 7- to 11-inch rainbows in 1990. This group of fish should begin to replenish the fishery in the summer of 1991. Anglers will probably see fewer rainbows over 14 inches this summer, a result of low flows that took place three or four years ago.

Fishing Regulations and Management Plan

Creel survey work done in 1986 indicated brown trout were probably being overharvested. Anglers did not necessarily select for brown trout, but it was a situation where brown trout numbers were very low and angler numbers were very high. In spite of their low numbers, browns are important in the Missouri because they grow much larger than rainbows. The latter feed primarily on tiny insects throughout their lives, and as a result rarely exceed 20 inches in length. Browns, on the other hand, feed heavily on forage fish, and often exceed 20 inches.

In 1987, we proposed an experimental regulation to protect brown trout under 22 inches in a six-mile river section near Craig. Intended to determine if brown trout numbers could be enhanced by reducing harvest, the regulation would have limited this river stretch to fishing with artificial flies and lures only. Restrictions on bait fishing in special water are common in Montana and elsewhere, because mortality of trout caught and released on bait is known to be four or five times that of fish caught on artificials. Although the concept of protecting the Missouri's brown trout did not seem to be a problem, the idea of eliminating bait fishing touched off a firestorm of controversy.

Bait fishermen felt they were being discriminated against, and the dispute became a major news event. At least three feature articles, two editorials, and a dozen "letters to the editor" on the subject appeared in the Great Falls Tribune during 1987. The proposal's death after a 3-2 vote of the Fish and Game Commission in November was front-page news. Public awareness of the Missouri's fishery resource had reached a new high.

In rejecting the brown trout proposal, the commission directed the department to prepare management plans for the Missouri and other key fisheries in the state. The purpose was to identify important management issues, formulate a range of possible solutions to problems, solicit public comment, and then select preferred alternatives. Management plans provide a coherent means of considering a wide variety of resource issues such as fishing regulations, habitat protection and enhancement, access, enforcement, and user conflicts. Extensive public involvement in a management planning process

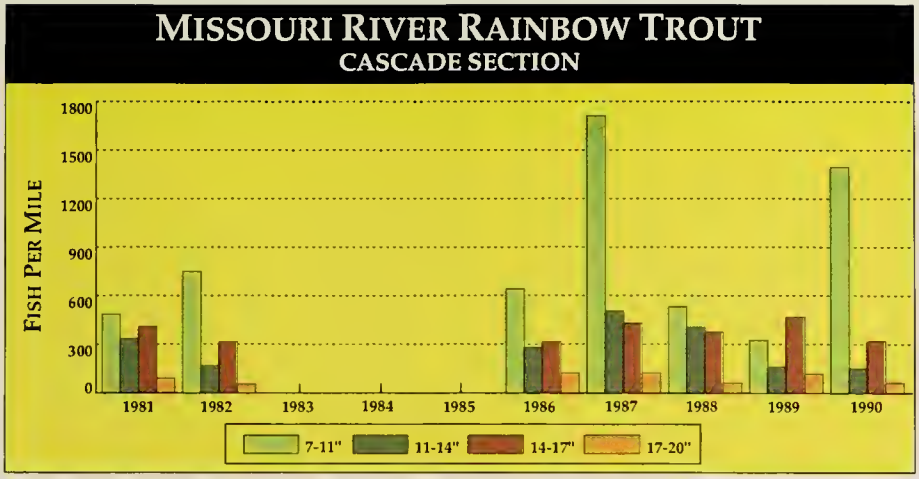


FIGURE 2. Number of rainbow trout per mile in the Cascade section.

usually results in a better understood and more acceptable management program.

The Missouri River management planning process was initiated in fall of 1988. Three public meetings were held to identify key concerns and gather opinions on how the river should be managed over the next five years or so. After several brainstorming sessions, we produced a report in June of 1989 that presented a variety of solutions to the issues raised during public meetings. We then developed a questionnaire addressing possible management options and sent it to 1,260 individuals representing sporting clubs, unaffiliated river anglers, those who attended the public meetings, and others. Nearly 500 survey forms came back. After analyzing the results, we prepared a final report listing recommended management alternatives and survey results for discussion at public meetings. The final management plan prompted little controversy and was adopted by the Fish and Game Commission in September of 1989.

This plan contains some important provisions. It requires the release of all brown trout smaller than 22 inches on the entire 35-mile stretch from Holter Dam to Cascade. It does not outlaw bait fishing—a departure from the usual management strategy on special regulation waters. We did not feel the effectiveness of the new regulation would be compromised by allowing bait fishing, since our data show that relatively few anglers use bait and they catch more rainbow than brown trout.

The plan also protects spawning runs of rainbow trout in the Dearborn by allowing only catch-and-release fishing during winter and spring, and protects spawning brown trout in Little Prickly Pear Creek by closing the lower 12 miles during fall. Last, it includes provisions for modifying or removing barriers such as beaver dams and irrigation diversions in spawning streams; possible enhancement of trout and smallmouth bass populations in the lower river (near Great Falls); restoring and protecting stream banks; and prioritizing fishing access site needs.

CONRAD ROWE

The Missouri is perhaps best known for its large, scrappy rainbow trout.

Some options were not adopted even though they were endorsed by the public. A majority of survey respondents favored restrictions on motorboat use, on outfitter use, and on rainbow trout harvest. Rather than pursue motorboat restrictions at this time, we are asking motorboat operators to observe a voluntary "no wake" rule when other boats or anglers are nearby. Outfitter use has been a hot topic statewide, but the department's role and authority to regulate outfitter use is not clear. Since survey data indicate that guided anglers harvest very few fish, the issue centers on river crowding. We decided not to change rainbow trout regulations because current harvest levels do not appear to be affecting the population. We will continue to monitor this situation and periodically assess the need for new regulations.

THE FUTURE

The 1980s proved to be a decade of tremendous change for the new Missouri. Although the trout populations weathered the one-two punch of increased fishing pressure and drought, many of the "quality" aspects of the fishing experience did not. The river is now a very busy place in the summer, a fact that is not likely to change. Three of the top six problems identified by anglers in the 1989 survey were too many motorboats, too many outfitters, and too many floaters. A 1990 survey done for the Montana Board of Outfitters on 10 popular Montana trout rivers revealed much higher levels of user conflict on the Bighorn and Missouri than on the other eight rivers.

Habitat degradation will continue to be a concern on the Missouri, as will the possibility of more years of drought. At this writing, runoff potential appears much improved over the past several years. Department biologists have worked closely with Conservation Districts and landowners to lessen the impact of irrigation diversions on streambeds, but significant dewatering of spawning streams still occurs in dry years. Creative and possibly expensive water transfer agreements need to be

See MISSOURI RIVER, page 13